SHIPS and MORE SHIPS for DEFENSE . . . In their fabrication dissolving wood pulp plays an important part as an ingredient in the flux coating on welding rods.

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Pulp Producers Form Export Corporation

● The American Pulp Export Corporation was formed the latter part of November by a group of Pacific Coast producers of wood pulp for the market. Its principal objective is the stabilization and promotion of the export market for American wood pulp after the war.

This forward looking move was taken after long consideration of the problems with which the industry will be faced when the Scandinavian countries are again able to export their pulp throughout the world. While there has been much general talk about solving post war problems these pulp producers have been studying plans for constructive action for over a year.

With American pulp exports at a high level due to the bottling up of the Scandinavian producers, the time appears ripe to solidify the position of American pulp in the world market. Cooperative action will undoubtedly prove more successful than individual company action.

Consequently the American Pulp Export Corporation was formed by the Puget Sound Pulp & Timber Company, Soundview Pulp Company, St. Regis Paper Company, Rayonier Incorporated, Crown Zellerbach Corporation and the Weyerhaeuser Timber Company, and papers have been filed with the Federal Trade Commission under the Export Trade Act for the purpose of exporting wood pulp and related products. Offices will be maintained in Reno, Nevada.

Officers of the export corporation are: J. D. Zellerbach, chairman of the board of directors; Ossian Anderson, president and a director; Walter A. Starr, vice president and a director; Edward M. Mills, Roy K. Ferguson and Robert B. Wolf, directors, and Julian R. Bauer, assistant secretary. Philip Ehrlich, San Francisco attorney, is counsel.

The companies forming the export corporation will provide it with $1,000,000 in capital and expect that it will advance and promote export trade now and in the post war era in the following manner:

1. By providing standardized sales methods based on accurate information regarding markets, grades required, and services which will appeal to foreign buyers.

2. By establishing proper designations or "grade markings" of various grades of pulp to be sold, and a fair evaluation of the spread in values between the various grades.

3. By overcoming sales resistance in foreign markets occasioned by the practice of domestic producers who, having only a temporary supply of pulp, have gone into the foreign market for a spot sale of such sulprus. (Such practice has lent itself to dumping in a market where most sellers have to depend upon dealer methods without having accurate information as to prices, shipping costs, grade requirements, and a number of other essential facts.)

4. By providing dependable statistical information.

5. By carrying on an advertising and sales promotion program designed to advance the use of cellulose products.

Details of the new export company's plan of operation indicate the United States will make a determined effort to maintain orderliness in the export market.

The new company will require each producer to furnish it with a sales projection for 1942, regarding desired tonnage to be exported. By July 1, each producer must submit a new sales projection covering the first half of the calendar year, 1943. Subsequently, on each January and July 1, similar half yearly projections must be submitted.

In this way, the export company will always have firm commitment for twelve months ahead.

The new company will attempt to sell

J. D. ZELLERBACH, Chairman American Pulp Export Corp.

OSSIAN ANDERSON, President, American Pulp Export Corp.

the total sales projection, but control of sales is likewise provided in this manner:

Quantities of each grade specified for sale for 1942 shall not exceed 110 per cent, or less than 90 per cent, of the quantities of each such grade sold in 1940. There are likewise restrictions against increasing or decreasing by more than 10 per cent the amounts specified in subsequent sales projections.

If the export company cannot meet its sales commitments abroad, it may obtain the deficiency in supply of pulp from other sources other than the companies controlling.

The controlling companies, however, now account for the bulk of domestic exports.

Blackout Slows Production At Some Mills

● The blackout ordered by the Second Interceptor Command, extending from the Canadian border to Eugene, Oregon, and beginning Monday night, December 8th, slowed up production in some Puget Sound and Columbia River pulp and paper mills the first night. In several plants operations ceased at 10 p. m. although the blackout did not start until 12:30 a. m. Since Monday the time has been from 1:30 to 7:30 a. m.

Sheets of pulp and paper were hurriedly applied to windows and lights were reduced to a bare minimum. Tuesday morning large crews began painting windows either blue or black.

The mills of Rayonier Incorporated, producing essential dissolving pulps and located at Shelton, Hoquiam, Tacoma and Port Angeles; the plants of Crown Zellerbach Corporation at Port Townsend and Port Angeles; and the plant of Fibreboard Inc., at Port Angeles, did not lose a minute's production.

Rayonier's safety supervisors had laid plans to take care of emergency blackouts. These were made following the practice blackout held in Northwest cities last June. When the order came early Monday evening for a blackout at 12:30 a. m. Rayonier immediately placed several thicknesses of pulp on every window and Tuesday morning began applying blue paint. By dark Tuesday evening most of the windows were painted and the entire job was completed Wednesday.

By the end of the first week all mills were blacked out, fully prepared to keep on producing essential pulp apnd paper regardless of any air raid that might occur.

Crown, Rayonier and Fibreboard Hold Technical Meeting

● Crown Zellerbach Corporation held its annual technical and superintendents convention at the Benson Hotel, in Portland, Oregon, on November 13th, 14th and 15th. About 60 technical and operating representatives of the Crown mills, Rayonier Incorporated and Fibreboard Products attended the three-day gathering.

J. W. Wenger, of Port Angeles, Washington, was acting chairman in the absence of Howard C. Graham.

Frank Drumb, of the San Francisco executive offices of Crown Zellerbach Corporation, gave a talk on Friday on the company's participation in the national defense program.

No Change in Pulp Prices

Export prices reduced to domestic level plus export costs—Start made to control paper prices.

The following announcement concerning prices of wood pulp for the first quarter of 1942 was made by the Office of Price Administration:

"There will be no change in domestic wood pulp prices through the first quarter of 1942 as a result of extension of individual agreements between pulp producers and the Office of Price Administration, Leon Henderson, administrator, announced November 26th.

"These individual agreements, concluded late in October after several producers had agreed to withdraw fourth quarter price increases previously announced, continued in effect for the remainder of 1941 the prices that generally had prevailed since June, 1940. Extension of these prices for the first three months of 1942 contributes importantly to stable prices for paper, Mr. Henderson said.

"Leading grades of pulp covered by the voluntary agreements and the maximum first quarter domestic prices are: bleached sulphite, bond and book, $72.50 a ton, on dock Atlantic seaboard; soda pulp, $66.00 a ton, delivered; bleached southern and bleached northern kraft, $82.50 a ton, on dock Atlantic seaboard; and ground wood, $40.00 a ton delivered.

"These are representative of contract prices charged during the fourth quarter. In the case of unbleached northern and southern kraft, each producer has agreed not to exceed the fourth quarter contract prices. In respect to all other grades of pulp, the differentials in effect during the fourth quarter will be retained throughout the first quarter of 1942. Certain individual situations are undergoing investigation by OPA and minor adjustments may be found desirable, it was stated.

"Mr. Henderson disclosed that in addition to domestic pulp prices, the agreements have been broadened to cover export prices and prices at which sales will be made to the government under the lend-lease program.

"Lend-lease pulp purchases usually are shipped from the West Coast. The agreements provide that maximum prices shall be computed by taking the Atlantic seaboard base price, deducting average freight from the producing mill to its domestic customers in the past three months, and then adding the actual cost of transporting the pulp to the port of shipment. This will result generally in prices well below those that have prevailed recently in lend-lease sales.

"Similarly, substantial savings to Latin and South American buyers of United States pulp are involved in the new arrangements for export sales. Maximum export prices, according to the understandings, will be based on the net mill realization price of domestic sales, plus freight, insurance, financing fees, and other costs actually involved in export sales."

Pulp prices have not changed since July 1, 1940, but costs have risen steadily. Increased production no longer results in increased profit for the pulp producers. It appears that the prices for the second quarter of 1942 will depend upon how much higher production costs rise between now and the end of March, 1942.

Although pulp prices have been maintained at the same level for a year and nine months, some paper prices have risen considerably. The OPA has been slow in examining the increases in paper prices and it's just now getting down to serious efforts at control. This is also true of the jobber situation where inventory mark-ups have been frequently very profitble.

The following two official statements state what is being attempted in the above connection:

"Manufacturers of more than 50 per cent of writing, book and printing paper (excluding newsprint) have indicated to the Office of Price Administration that no increase in their prices are in prospect for the near future, Leon Henderson, administrator, announced November 27th.

"Expressions to this effect came in replies to letters sent recently by OPA to about 250 paper producers. In these letters, Mr. Henderson said it had been reported to his office that further price advances were being planned by certain manufacturers. He asked producers to consult OPA before taking any price action, and specifically to submit cost data to justify contemplated increases.

"Typical of the replies received was one that said, 'we are renewing our contracts for 1942, putting into effect for the first quarter, that is, until April 1, the same prices that prevail for the last quarter of this year.'

"Producers of writing, book and printing paper do not make newsprint. The latter is sold on annual contract with provision for price adjustments quarterly. There has been no change in newsprint prices for some time.

"Extension of fourth quarter wood pulp prices through the first three months of 1942, announced yesterday by OPA, is an important factor in maintaining stable prices for all forms of paper. About 95 per cent of all wood pulp produced is consumed by the paper industry."

"More than 100 representative wholesalers of paper products have individually indicated their willingness to abide by requests of the Office of Price Administration for a sharp reduction in the present jobber's mark-ups in prices of kraft wrapping paper, Leon Henderson, administrator, announced November 25th.

"Similar requests will be made individually to all other members of the trade.

"While the understandings, which became effective November 20, are limited to kraft wrapping paper, the method of determining mark-ups on that item will be generally applicable to all other coarse paper products sold through jobbers. It is planned to make similar individual requests with respect to other coarse paper products as soon as practicable.

"Jobber's mark-up" is a term used to describe an addition made by a wholesaler to the price charged by a producer.

The mark-up provides an operating margin to wholesalers for their services in maintaining and operating an elaborate distribution system for a wide variety of products.

"By a series of individual agreements made with paper mills, OPA has kept the producers' price of southern kraft wrapping paper, which makes up the bulk of the output, stable at around 4½ cents a pound for the past several months. Northern kraft wrapping paper sells at about one-half cent a pound higher.

"While these agreements have been successful in maintaining stable prices at the source, unusual demand resulting from increased business activity has created an abnormal situation in the wholesale field. Jobber's mark-ups have increased 2c to 5c a pound on standard grades and even more on specialty grades. Hence, the cost of kraft wrapping paper to the ultimate consumer has become inflated and the effect of stable prices at the source has been lost.

"The Office of Price Administration's agreements reduce mark-ups sharply. Using as a guide the 'Manual of Standard Accounting and Costing for the Paper Distributing Trade," which was developed by the paper distributing trade during the NRA days, the understandings set specific mark-ups in terms of cents per pound. They cover both northern and southern standard kraft wrapping paper in counter and 'jumbo' rolls, 40-pound basis weight and higher, with differentials above base prices for sheets, special sizes and cuts and 'super-standard' grades. Mark-ups are graduated according to quantity contained in a single delivery and jobbers' prices are f.o.b. jobbers' warehouse.

"As applied to standard kraft wrapping paper in rolls, the agreements establish maximum prices for jobbers as follows:

Quantity Contained in Single Delivery (Pounds)	Maximum Prices to Consumers (Including Jobber's Mark-up) (Cents per Pound)
Less than 100	$9.00
100 to 499	7.50
500 to 999	6.25
1,000 to 1,999	6.10
2,000 to 9,999	6.00
10,000 and over	5.75

"Mr. Henderson pointed out that chipboard and all grades of paperboard and paperboard specialties, which are handled by wholesalers frequently as an accommodation to their customers, are covered by Price Schedule No. 32, Paperboard Sold East of the Rocky Mountains.

"Several plans dealing with the question of distributors' mark-ups for paperboard are under consideration. However, until such time as a definite decision is reached on the matter, no sale of paperboard, whether by a mill agent, jobber, broker, or wholesale paper merchant, may be made above the maximum prices established in Price Schedule No. 32."

Pacific Paperboard No. 2 Machine Starting This Month

● Pacific Paperboard Company, Longview, Washington, turned over the dryer section of the company's second board machine on November 15th, for a trial run. This is a 60-inch board machine.

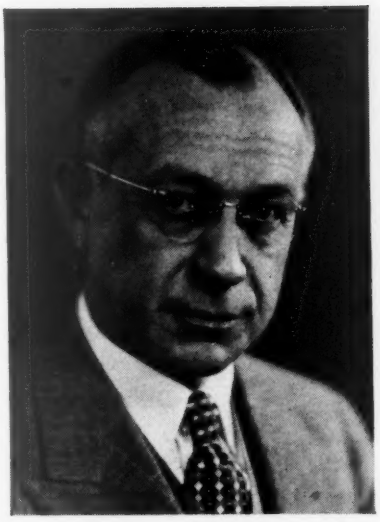
The stuff pumps, driven by a 250 h.p. electric motor, and a one-ton Jones beater remained to be installed, before production was scheduled to start early in December.

M. B. Houston Named Vice President of Rayonier

● Morton B. Houston was appointed a vice president of Rayonier Incorporated on November 24th according to an announcement by the company on that date. Mr. Houston will fill the position left vacant by the death of W. L. Raymond on November 9th.

Mr. Houston has been associated with Rayonier Incorporated for eleven years, having entered the organization as purchasing agent and subsequently serving for a number of years as assistant to Mr. Raymond. His headquarters will be in the company offices at 719 White Building, Seattle.

Prior to his association with Rayonier Incorporated, Mr. Houston had been identified with the pulp and paper industry in various capacities since 1912. He brings to his new position an extensive background of experience and an intimate knowledge of the duties which he is assuming.



M. B. HOUSTON, Vice President Rayonier Incorporated

Blackouts Create Rush For Heavy Papers

● The unexpected outbreak of war with Japan and the even more unexpected blackouts of Pacific Coast cities as protection against possible air raids from Japanese plane carriers, resulted in the cleaning out of jobbers' stocks of heavy papers suitable for shielding windows.

Most popular with the citizens was laminated kraft paper, two sheets of kraft paper with asphalt between, known as building or sheathing paper. Not so strong but equally effective as a light barrier is black building paper. By Wednesday, December 10th, jobbers were pretty well cleaned out of laminated kraft in 16-lb. rolls 36-inches wide and containing 500 square feet. Larger rolls were not in such great demand.

Hardware stores, lumber dealers and even department stores and cigar stands bought the heavy papers for resale to anxious citizens. Retail prices quite naturally went up in the face of the demand. Stocks in cellulose tape were also depleted.

Status of Japanese In B. C. Mills

● Status of approximately 1,000 Japanese working in British Columbia's pulp and paper mills depends on the policy to be followed by Canadian military and civilian police authorities.

Principal employers of Japanese labor are Pacific Mills at Ocean Falls and British Columbia Pulp & Paper Company at Woodfibre and Port Alice.

Asiatics have been employed at these plants partly because the class of work they do is not usually acceptable to satisfactory white labor. Another argument of the pulp companies was that Japan was an important customer and it was not considered desirable to cause discrimination that might be resented. The latter argument, of course, has not been applicable in recent months.

Of the 25,000 Japanese in British Columbia, about 16,000 are naturalized Canadians. There are no definite statistics regarding the status of citizenship of the Japanese engaged in the pulp mills, but it is presumed that most of them have established citizenship in Canada and for that reason they may not be affected by any new federal orders. There is a strong possibility, however, that alien Japanese will be interned.

Precautions were taken early in the war to safeguard pulp and paper mills against sabotage, and now that war has shifted to the Pacific protective facilities are being increased.

Beloit Yankee Dryer Installed On Camas No. 9

● A large Yankee dryer was installed on No. 9 paper machine of Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, during the last week of November. This Yankee dryer is 12 feet in diameter and 137 inches long. It was furnished by the Beloit Iron Works.

Changes were made in the shafting to accommodate the Yankee dryer. Drew and Hoffman, of Portland, Oregon, installed a hood and ventilating system over the Yankee, while the machine was shut down.

J. E. Hanny, resident manager, said the machine was "doing very well," after a four-day shut-down for the installation. During this time the whole machine was overhauled.

Superintendents Hold Eighth December Meeting in Seattle

Hear three papers, participate in discussions of pulp and paper production problems—Robert L. Eminger, National Secretary-Treasurer is honor guest.

THE Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association held its eighth December meeting at the New Washington Hotel in Seattle, December 5th and 6th with close to 200 men and women in attendance.

The men attending heard three excellent papers on the life of fourdrinier wires, the effect of mixed pulp furnishes on sheet properties, and the application of the rotameter to the pulp and paper industry. They also heard an informative talk on the industry's part in national defense and took part in discussions of pulp and paper mill operating problems which lasted all Saturday afternoon. On Friday afternoon some of the group visited mills in Everett and Tacoma while others put on an informal bowling tournament. The parties on Friday and Saturday evening provided a recreational balance for the serious side.

The attendance was more than ordinarily a representative cross section of the Pacific Coast industry, management, superintendents, engineers and technical men, together with the equipment and supply men whose attendance and contributions of ideas are so important to the success of the meetings held by both the Superintendents and technical association.

Since their inception the meetings of the Pacific Section of TAPPI and of the Pacific Coast Division of the Superintendents have probably been more representative of the industry on the average than those held in other parts of the country. This was evident at the Fall Meeting of National TAPPI, held in Seattle in August of 1940, and was equally evident at the Superintendents meeting just closed.

Superintendents are taking part in TAPPI meetings and technical men are participating in the Superintendents meetings. That the trend toward closer collaboration is felt throughout the entire industry was shown by the announcement made at the business meeting on Saturday by Robert L. Eminger, national secretary-treasurer of the Superintendents, that the association had recently broadened its basis for admission to include all men performing work of a supervisory nature, including technical directors. On the other hand, a large number of superintendents are active in TAPPI.

The participation of superintendents in the technical meetings and vice versa, greatly enlarges the value of the group meetings to the industry by providing broader discussions of operating problems.

The December Meeting

● The 1941 meeting was arranged under the general chairmanship of Sam A. Salmonson, assistant superintendent of the Soundview Pulp Company, Everett. Assisting him as co-chairmen were, Andrew D. Hawley, in charge of the Seattle office of the Pacific Coast Supply Company, and Walter A. Salmonson, Washington representative for Simonds Worden White.

Fred R. Armbruster of the Great Western Division, The Dow Chemical Company, Seattle, served as chairman of registration. Merrill E. Norwood, paper mill superintendent, Columbia River Paper Mills, Vancouver, Washington, arranged for the papers in his capacity as first vice chairman of the Superintendents. James F. Brinkley of Seattle arranged golf matches for those who desired to play on Friday afternoon.

Ray Smythe of the Rice Barton Corporation, Portland, took charge of the breakfast on Saturday, and, as toastmaster woke the men up for the serious program of papers at 9:30.

Registration started at 9:30 a. m. on Friday to avoid the usual Friday afternoon and evening rush. No program was scheduled for the afternoon but informal groups gathered at luncheon and later visited mills, bowled or remained in the hotel and "made pulp and paper."

The informal masked dancing party started at 9:30 p. m. but the masking didn't last long for they proved too warm for dancing. Good music kept the crowd going until late.

Saturday's Program

● The usual procedure of fining the late comers at the "Wake Em Up Breakfast" was reversed by toastmaster Ray Smythe. Calling the guilty ones to the head table for reminders that the breakfast started at 8 o'clock, he presented each with a toy novelty instead of extracting the expected fine.

The program of papers and discussion started at 9:30 and was well attended. Niles M. Anderson, chairman of the Pacific Coast Division, presided and called upon Reverend Robert T. McFarlane of the Westminster Presbyterian Church to give the invocation.

Following the invocation Mr. Anderson called upon H. A. Des Marais, past

Seated at the SPEAKERS' TABLE for the Saturday luncheon, were, left to right, ANDREW D. HAWLEY, Co-Chairman of the Superintendents meeting and in charge of the Seattle office, Pacific Coast Supply Co.; SAM A. SALMONSON, General Chairman of the meeting and Assistant Superintendent, Soundview Pulp Company; H. A. "Gob" DES MARAIS, past Secretary-Treasurer of the Pacific Coast Division and Pacific Coast Manager, General Dyestuff Corp.; ROBERT L. EMINGER, National Secretary-Treasurer, American Pulp & Paper Mill Superintendents Assn., Miamisburg, Ohio.

FRANK N. YOUNGMAN, Vice President, Crown Zellerbach Corp., Portland, who spoke on, "The Pulp & Paper Industry's Part In Our National Defense"; NILES M. ANDERSON, retiring chairman of the Pacific Coast Division, and General Superintendent, St. Regis Paper Co., Kraft Pulp Division; WILLIAM D. "BILLY" WELSH, Crown Zellerbach Corp., San Francisco, Toastmaster; DAVID B. DAVIES, Operating General Manager, Rayonier Incorporated; MERRILL E. NORWOOD, newly elected Chairman of the Pacific Coast Division and Paper Mill Superintendent, Columbia River Paper Mills; GEORGE H. McGREGOR, First Vice Chairman, Pacific Coast Division and Superintendent, Longview Mill, Pulp Division Weyerhaeuser Timber Co.; and, WALTER A. SALMONSON, Co-Chairman of the meeting and Washington representative for the Simonds Worden White Co.

secretary-treasurer, who was serving again in that capacity in the absence of A. S. Quinn in the East on a business trip, to read the names of the members of the Superintendents Association who passed away during the last year. Mr. Des Marais read the name of Lester S. McCurdy, paper mill superintendent, Crown Zellerbach Corporation, Port Townsend, Washington, whose death occurred last August. Mr. McCurdy was a past chairman of the Pacific Coast Division and fourth vice-president of the national association. He also read the name of Walter S. Hodges of Portland, who, while not a member of the association, had many friends among the members and was always a strong supporter. Mr. Hodges died in October as a result of an automobile accident.

New Officers

● Chairman Anderson called for a report of the nominating committee and the following names were presented. The elections were unanimous.

For chairman in 1942: Merrill E. Norwood, paper mill superintendent, Columbia River Paper Mills, Vancouver, Washington.

For first vice chairman: George H. McGregor, superintendent, Longview Mill, Pulp Division Weyerhaeuser Timber Company, Longview.

For second vice chairman: Charles G. Frampton, superintendent, Fernstrom Paper Mills, Inc., Pomona, California.

For third vice chairman: Sam A. Salmonson, assistant superintendent, Soundview Pulp Company, Everett.

For secretary-treasurer: A. S. Quinn, vice president, Stebbins Engineering Corporation, Seattle.

Merrill E. Norwood

● Merrill E. Norwood, chairman of the Pacific Coast Division, is paper mill superintendent of the Columbia River Paper Mills at Vancouver, Washington. He has had extensive experience in paper manufacturing starting with the International Paper Company at Glen Park, New York, in the Bureau of Tests. After five years at Glen Park he was transferred to International's plant at Bangor, Maine, and spent a year there as backtender. Then he moved to the St. Regis Paper Company's mill at Deferiet, New York, as backtender and remained there for two years, coming to the Pacific Coast in January, 1920. His first work on the West Coast was as backtender at the Crown Willamette Paper Company's mill at Camas. After two years he went to Powell River, B. C., as backtender. Two years in Powell River and he left for Camas again where he stayed for over six years.

Then followed two years as machine tender for the Hawley Pulp & Paper Company at Oregon City and a six months' stay at Camas as machine tender before he joined the Columbia River organization in 1936 as machine tender. On August 1, 1937, Mr. Norwood was made paper mill superintendent.

George H. McGregor

● First vice chairman of the Pacific Coast Division for 1942 is George H. McGregor, superintendent of the Longview Mill, Pulp Division Weyerhaeuser Timber Company. Mr. McGregor graduated from the University of Wisconsin in 1925 with the degrees of B.S. and M.S. in chemical engineering. From 1925 until 1928 he was with the Northwest Paper Company in Cloquet, Minnesota, as a chemist. In the latter year he was awarded the company's fellowship in graduate study at the University of Wisconsin.

Upon completion of this study in 1929 he returned to the Northwest Paper Company and was placed in charge of their laboratories. In 1931 he resigned to become an instructor in pulp and paper manufacture at the Institute of Paper Chemistry in Appleton, Wisconsin. Three years later he left to join the Weyerhaeuser organization in Longview. From 1934 until May 1, 1938, Mr. McGregor served Weyerhaeuser in several capacities including that of technical director. On that date he was appointed superintendent by W. Norman Kelly, manager of the Longview mill.

Mr. McGregor has taken an active part in the Superintendents and TAPPI organizations on the Pacific Coast, serving the latter group in 1937 as vice chairman and in 1938 as chairman of the Pacific Section.

Charles G. Frampton

● Charles G. Frampton, superintendent of the Fernstrom Paper Mills, Incorporated, Pomona, California, has had a board experience in paper manufacturing in the East, Middle West and on the Pacific Coast. Mr. Frampton was elected third vice chairman.

MERRILL E. NORWOOD, Chairman, Pacific Coast Division of the Superintendents

The Pulp and Paper Panel Discussions on Saturday afternoon proved so interesting the participants were reluctant to stop . . . In the top picture are the leaders of Pulp Panel, left to right, N. W. COSTER, Technical Direcor, Soundview Pulp Co.; ERIK EKHOLM, General Superintendent, Puget Sound Pulp & Timber Co.; A. M. CADIGAN, Technical Director, St. Regis Paper Co., Kraft Pulp Division; CLARENCE V. SMITH, Electrical Engineer, St. Helens Pulp & Paper Co.; NILES M. ANDERSON, General Superintendent, St. Regis Paper Co., Kraft Pulp Division; and, GEORGE H. McGREGOR, Superintendent, Longview Mill, Pulp Division Weyerhaeuser Timber Co., Chairman.

Leaders of the Paper Panel Discussion were, left to right, CHARLES E. ACKLEY, Mill Superintendent, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Lebanon, Ore.; FRED A. OLMSTED, Technical Supervisor, Crown Willamette at Camas, Wash.; MERRILL E. NORWOOD, Paper Mill Superintendent, Columbia River Paper Mills, and Chairman of the Paper Panel.

RUSSELL M. COOPER, General Superintendent, Powell River Co.; V. L. TIPKA, Research Engineer, Hawley Pulp & Paper Co.; GUS E. OSTENSON, Paper Mill Superintendent, Crown Willamette at Camas; and, GRANT D. ROSS, Master Mechanic, St. Regis Paper Co., Kraft Pulp Division.

At the "Wake Em Up" Breakfast Toastmaster RAY SMYTHE surprised the late comers by giving them presents instead of extracting fines.

Sam A. Salmonson

● Sam A. Salmonson, assistant superintendent of the Soundview Pulp Company, Everett, Washington, will serve as the third vice chairman of the Pacific Coast Division in 1942.

Mr. Salmonson was born in Sweden and came to the United States with his parents as a child of three. His first contact with the pulp and paper industry came in 1904 when he went to work for the Union Bag and Paper Company at Hudson Falls, N. Y. He remained three years and during that time worked in the groundwood, sulphite, soda and sulphate departments. In 1907 he went to Rumford, Maine, to work for the Oxford Paper Company as night superintendent.

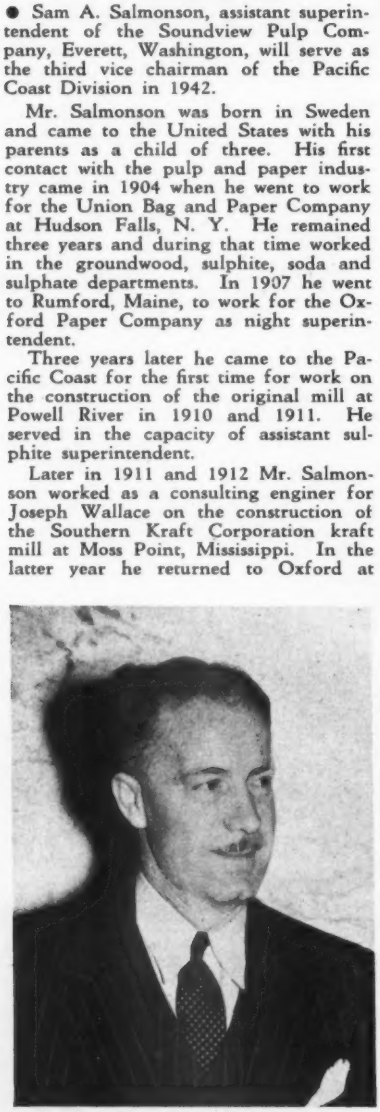
Three years later he came to the Pacific Coast for the first time for work on the construction of the original mill at Powell River in 1910 and 1911. He served in the capacity of assistant sulphite superintendent.

Later in 1911 and 1912 Mr. Salmonson worked as a consulting enginer for Joseph Wallace on the construction of the Southern Kraft Corporation kraft mill at Moss Point, Mississippi. In the latter year he returned to Oxford at Rumford, Maine, to take charge of the sulphite pulp mill. The next year, 1913, he left Oxford to become associated with Carl Bach-Wiig of Portland, Maine, in a consulting engineering capacity.

In the early part of 1916 the operating end again interested him and he accepted the position of sulphite superintendent for the Pjepscot Paper Company at Lisbon Falls, Maine.

His next move was into Canada to work for the Riordan Pulp & Paper Company from 1917 to 1919 at Merriton, Ontario, as general superintendent. In the latter year he was transferred to the plant at Temiskaming, Quebec (now the Kipawa sulphite pulp mill of the Canadian International Paper Company), in the same capacity as at Merriton.

The Pacific Coast claimed Mr. Salmonson a second time in 1922 when he became associated with the Whelan Pulp & Paper Company at Swanson Bay, B. C. After a few months there he went to Camas as sulphite superintendent for the Crown Willamette Paper Company. From 1923 until 1935, Mr. Salmonson was sulphite superintendent at Camas and part of the time at the West Linn mill. In the latter year he left Camas to become assistant superintendent for the Soundview Pulp Company under general superintendent, G. J. Armbruster.



GEORGE H. McGREGOR, First Vice Chairman, Pacific Coast Division

Albert S. Quinn

● Albert S. Quinn, who was reelected secretary-treasurer, is a graduate in civil engineering from Cornell University. In 1930 he came to the Pacific Coast as manager for the Stebbins Engineering & Manufacturing Company, and in 1937, when the subsidiary company, Stebbins Engineering Corporation, was formed, he was elected vice president.

Mr. Quinn was elected secretary-treasurer of the Pacific Coast Division in December, 1937, to succeed H. A. Des Marais who had served in that capacity since the division was organized in 1933. Mr. Quinn was reelected in 1938, 1939, 1940, and again at the meeting in Seattle this month.

The Papers

● Following the election of officers national secretary-treasurer Robert L. Eminger expressed the greetings of the national officers and described the recent changes in the rules for membership to embrace all men in the industry serving in supervisory capacities.

The first paper presented was, "An Investigation of the Effect of Mixed Pulp Furnishes on Sheet Properties," by Robert A. Baum, chief assistant chemist, Fernstrom Paper Mills, Inc., Pomona, California.

The second paper, "Wire Life," was given by Gus Ostenson, paper mill superintendent, Crown Willamette Paper Co., Division of Crown Zellerbach Corporation, Camas, Washington.

The third paper dealt with "Rotameters in the Pulp and Paper Industry," and was presented by Roger E. Chase of R. E. Chase & Company, Tacoma, who demonstrated the working of this relatively new device for measuring the flow of liquids.

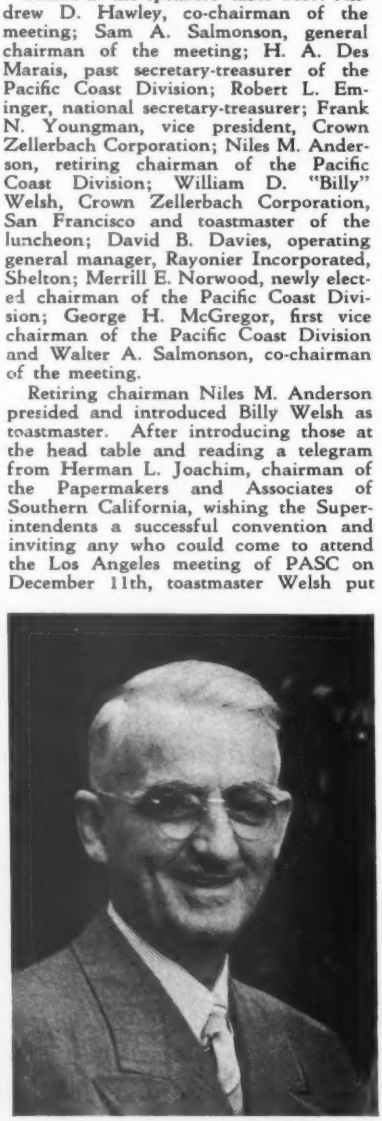
Discussion followed each paper.

The Luncheon

● The men's luncheon on Saturday was featured by an interesting talk on "The Pulp and Paper Industry's Part in Our National Defense," by Frank N. Youngman, vice president of Crown Zellerbach Corporation, with headquarters in Portland.

Seated at the speakers' table were: Andrew D. Hawley, co-chairman of the meeting; Sam A. Salmonson, general chairman of the meeting; H. A. Des Marais, past secretary-treasurer of the Pacific Coast Division; Robert L. Eminger, national secretary-treasurer; Frank N. Youngman, vice president, Crown Zellerbach Corporation; Niles M. Anderson, retiring chairman of the Pacific Coast Division; William D. "Billy" Welsh, Crown Zellerbach Corporation, San Francisco and toastmaster of the luncheon; David B. Davies, operating general manager, Rayonier Incorporated, Shelton; Merrill E. Norwood, newly elected chairman of the Pacific Coast Division; George H. McGregor, first vice chairman of the Pacific Coast Division and Walter A. Salmonson, co-chairman of the meeting.

Retiring chairman Niles M. Anderson presided and introduced Billy Welsh as toastmaster. After introducing those at the head table and reading a telegram from Herman L. Joachim, chairman of the Papermakers and Associates of Southern California, wishing the Superintendents a successful convention and inviting any who could come to attend the Los Angeles meeting of PASC on December 11th, toastmaster Welsh put



CHARLES G. FRAMPTON, Second Vice Chairman, Pacific Coast Division

the group in a jovial mood with several of his stories.

He then introduced Mr. Youngman.

Mr. Youngman's Talk

● Mr. Youngman opened his talk before the Superintendents' luncheon by saying he thought this meeting of the men in the industry for the purpose of discussing common problems was of greater importance today than ever before because of the vital necessity of pulp and paper to defense.

Ordinarily, said Mr. Youngman, the public doesn't appreciate the importance of paper in the daily lives of individuals, and so until recently had no idea how vital the industry's products are in the expansion of our defense program. However, the necessity of adequate pulp and paper supplies to defense is being brought home to the people as they come up against shortages in products they have been taking for granted. In several areas paper bags are scarce and signs in grocery stores request customers to bring their own shopping bags or baskets to help conserve the supply of paper.

In the Middle West and East, where waste paper supplies, used in making paperboard for shipping containers, is inadequate to meet the demand of the accelerated production, campaigns are under way to persuade the people to save paper and either sell it to dealers or donate it to various organizations. These campaigns are bringing results through the radio, newspapers and personal calls by such organizations as the Boy Scouts of America. But, as yet the supply is insufficient to meet the demand.

In the last war, said Mr. Youngman, pulp and paper were not as important as they are in this one. The uses for both pulp and paper were not as highly developed and the supply situation was not as tight, although there were shortages in some materials. During the last World War imports of wood pulp from the Scandinavian countries were maintained while at the present time these are shut off and the United States and Canada are faced with the necessity of supplying all the world not tied to the Axis.

Today wood pulp is employed in making a great variety of important products. Since the last war rayon has developed tremendously, as we all know, and dissolving wood pulp is the basic raw material for rayon. Rayon is just now coming into general use by the armed forces for parachute troop clothing, powder bags and a number of other purposes. It is well known that rayon fabric in tires gives them greater strength and longer life. The giant tires, eight feet in diameter, built for the Douglas B-19 bomber each contain 150 miles of rayon yarn. This is a more spectacular use of rayon than in the smaller but equally important tires on the Army's trucks and armored cars.

Originally nitrocellulose, as a propellant charge in shells was made from cotton linters, but the development in wood pulp purification has resulted in the production of equally satisfactory nitrocellulose. As the cotton linter supply is limited our government is calling upon the manufacturers of dissolving pulps to provide increasing quantities for nitrocellulose manufacture. The amount being produced for this purpose today will probably be doubled in 1942.

Wood pulp for rayon and nitrocellulose as well as for paper and board has to come from the mills of this country and of Canada. In addition we have to supply Great Britain and the countries of South America, markets formerly served by European producers.

In the old days, said Mr. Youngman, the normal operating ratio of our paper industry was 75 to 80 per cent of capacity. That was considered practically full-time operation. Now the industry is running at around 105 per cent of capacity (many mills are running seven days a week while capacity is based upon six-day operation). A new record will be set this year with a production of paper and paperboard around 21,000,000 tons. Predictions cannot be accurate but it appears that about 26,000,000 tons will be needed in 1942 to meet all requirements.

The principal reason for this shortage is the National Defense Program. Listing some of the uses to which paper and paperboard are being put will give an idea of the tremendous acceleration in consumption caused by the defense effort.

The army this year is using 1500 tons of board for packing shirts; 1000 tons for canned tomato shipping containers; 360,000 tons for ammunition cases; 11,000 tons or 550 cars of target paper.

The drafting work for each battleship takes 15 tons of blueprint paper. The government printing office is taking an unprecedented quantity of paper, 100,000 tons or 5,000 car loads. Steel plants are using 60,000 tons or 3,000 cars. Mimeograph paper to be consumed by government agencies amounts to 75,000 tons or 375 cars. Typewriter paper amounts to 125 cars or 2500 tons. Book paper used totals 12,000,000 pounds. The armed services are using 1,000,000 paper milk bottles daily.

One order of wrapping paper called for 50 car loads. Bags are being used by the million. Toilet tissue and paper towels are being bought by the service

FRANK N. YOUNGMAN, Vice President, Crown Zellerbach Corp., who spoke to the Superintendents

arms in tremendous quantities.

These are the high spots. In addition there are the large quantities of paper and board used by those doing defense work for the government.

People Must Economize

● The industry cannot take up the slack between production and consumption of paper and paperboard, said Mr. Youngman. People must economize. The practice of economy in paper and board consumption is just starting. It will have to be extended among civilian uses so that the defense uses can be provided for without delay.

Individuals can help by re-using bags, cartons and other papers. Newspapers and magazines will have to be saved in greater quantities than ever before to amplify the production of wood pulp. Mr. Youngman told how the shortage in board had caused one manufacturer of refrigerators to number each shipping container and print thereon a request that the dealer return the empty carton. When shipping containers become so valuable that a manufacturer in the East is willing to pay the freight on an empty carton from the Pacific Coast, we know that the shortage is real.

The industry is working to close the gap between production and consumption, Mr. Youngman said. Grades, weights, sizes and colors are being stand-

SNAPSHOTS at the Superintendents Meeting . . . Left to right, HARRY ANDREWS, Control Superintendent, and RUSSELL M. COOPER, General Superintendent, Powell River Company; DAVID B. DAVIES, Operating General Manager, Rayonier Incorporated; A. M. CADIGAN, Technical Director, St. Regis Paper Co., Kraft Pulp Division; and, WESLEY OSBORNE, Chemical Engineer, Hooker Electrochemical Co.

On the right are two visitors from Finland studying the kraft industry on scholarships from the Walter Ahlstrom Foundation, HANNES JANSSON, Assistant General Superintendent, Sunila Co.; Sunila, Finland; and, GUNNAR KULVIK, Assistant General Superintendent, Enso-Gutzeit Corp., Enso, Finland.

SAM A. SALMONSON, Third Vice Chairman, Pacific Coast Division

ardized as rapidly as possible. Thinner papers and boards will help conserve raw material. He cited one fruit wrap user who had insisted for years on buying 14 lb. paper although the standard is 12 lb. He was asked to use the 12 lb. wrap to conserve pulp and readily acquiesced. On his business alone the mill will save 15 tons of wood pulp by this drop of 2 lbs. in weight.

The industry has been asked to produce as much as possible without avoidable decline in quality, and this is a problem for the operating men, Mr. Youngman told the superintendents.

The industry is the seventh in size in the country and on that basis is normally important as an employer alone. In addition, it is now vital in the defense program. As a defense industry it needs help to maintain its equipment in good producing condition.

So far, said Mr. Youngman, the industry has not been given the recognition its position in the defense picture deserves. The present priority rating doesn't help on some materials. In the last war the mills held some equipment together with baling wire but even that is hard to obtain this time.

The government's responsibility to the industry, said Mr. Youngman, is to provide a reasonable priority to avoid more lost time than over time in the production of pulp, paper and paperboard for defense.

Mr. Youngman closed by telling the men at the luncheon that, "You operating men have a difficult time ahead in keeping your mills running at maximum capacity."

Upon the conclusion of Mr. Youngman's talk Mr. Welsh remarked that:

"A roll of newsprint freighted with honest news and editorials is one of the best defenses to keep us a nation of free people."

Niles Anderson thanked Mr. Youngman and Mr. Welsh for their important contributions to the success of the Superintendents meeting.

● Frank N. Youngman entered the industry in 1916, when he went to work for the Interlake Pulp & Paper Company, Division of Consolidated Water Power & Paper Company, Appleton, Wisconsin. He remained until 1920, except for the two years spent in the United States Army.

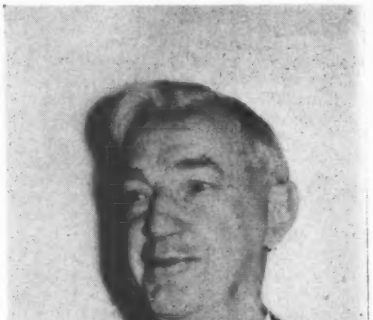
In 1920 Mr. Youngman became manager of the Stevens Point Branch of Consolidated Water Power & Paper Company, Stevens Point, Wisconsin. He went to Port Arthur, Ontario, in 1922, as manager of the Thunder Bay Paper Company, when this company was purchased by Consolidated Water Power & Paper Company and stayed for five years. During this time the present Thunder Bay newsprint mill was built under his supervision.

He moved to Vancouver, British Columbia, in 1927 as vice president and a director of Pacific Mills, Limited. In 1933 he came to Portland as assistant vice president of Crown Willamette Paper Company and was made vice president of Crown Zellerbach Corporation three years ago.

Panel Discussions

● The luncheon was over at 2 p. m. and from then until around 5:30 the two panel discussions, one on pulp and one on paper problems took the spotlight.

The pulp discussion was led by George H. McGregor, first vice chairman of the Pacific Coast Division and superintendent, Longview Mill, Pulp Division Weyerhaeuser Timber Company. Assisting him were: N. W. Coster, technical director, Soundview Pulp Company and past chairman of the Pacific Section of TAPPI; Erik Ekholm, general superintendent, Puget Sound Pulp & Timber Company; A. M. Cadigan, technical director, St. Regis Paper Company, Kraft Pulp Division; Clarence V. Smith, electrical engineer, St. Helens Pulp & Paper Company; and Niles M. Anderson, general superintendent, St. Regis Paper Company, Kraft Pulp Division, and retiring chairman of the Pacific Coast Division of the Superintendents.



ROBERT L. EMINGER, Secretary-Treasurer, Superintendents Association

Merrill E. Norwood, paper mill superintendent, Columbia River Paper Mills, and chairman of the Pacific Coast Division, served as chairman of the paper discussion. He was assisted by Charles E. Ackley, mill superintendent, Crown Willamette Paper Co., Division of Crown Zellerbach Corporation, Lebanon, Oregon; Fred A. Olmsted, technical supervisor, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, and past chairman of the Pacific Section of TAPPI; Russell M. Cooper, general superintendent, Powell River Company, Powell River, B. C.; V. L. Tipka, research engineer, Hawley Pulp & Paper Company; Gus E. Ostenson, paper mill superintendent, Crown Willamette Paper Company, Division of Crown Zellerbach Corp., Camas; and Grant D. Ross, master mechanic, St. Regis Paper Company, Kraft Pulp Division.

A broad range of pulp and paper operating problems were discussed by the two groups.

Banquet

● Following the panel discussions a reception was held at 6 p. m. in honor of Mr. and Mrs. Robert L. Eminger and the newly elected and retiring officers of the Pacific Coast Division.

At the banquet later, Niles M. Anderson, retiring chairman, presided and introduced the new officers who were present. The new chairman, Merrill E. Norwood, spoke briefly to the effect that he desired the same cooperation from the members of the division that had been extended to Mr. Anderson.

BOWLING attracted a crowd of men Friday afternoon . . . C. V. BASOM (left), Paper Mill Superintendent, Fibreboard Products, Inc., Port Angeles; and EARL G. THOMPSON (right), Northwest Manager, Great Western Division, The Dow Chemical Co., Seattle, watch NILES M. ANDERSON, General Superintendent, St. Regis Paper Co., Kraft Pulp Division, Tacoma, and retiring chairman of the Pacific Coast Division of the Superintendents, make a strike.

Keeping score is ALAN C. DUNHAM of Portland, Pacific Coast representative for Lockport Felts and Cabble Wires.

Robert L. Eminger, national secretary-treasurer, read a message from national president Oscar Stamets congratulating the Pacific Coast Division upon its successful work during the eight years since its organization. Mr. Eminger also read a short history of the national association.

Mr. Anderson told the group that second vice chairman Charles G. Frampton of Pomona had sent his regrets as being unable to attend, and that secretary-treasurer A. S. Quinn, who was East on a business trip, had likewise advised his regret. He held up a new gavel and said that the Pacific Coast Division wished to thank Mr. Quinn and the Stebbins Engineering Corporation for presenting it to the division at this meeting. The division is now well equipped to maintain order said Mr. Anderson, with the new gavel and the stainless steel gavel base presented at the June meeting by Harry H. Richmond, chairman of that meeting and chief engineer of the Electric Steel Foundry Company of Portland.

He commented upon the successful meeting arranged by general chairman, Sam A. Salmonson, his co-chairmen, Andrew D. Hawley and Walter A. Salmonson, and chairman of registration, Fred R. Armbruster. He also thanked Ray Smythe for serving as toastmaster of the breakfast meeting.

The Pacific Coast Division's appreciation for consistent support of its activities was expressed by Mr. Anderson to PACIFIC PULP & PAPER INDUSTRY.

Following the banquet the large crowd danced and enjoyed an excellent program of entertainment.

With the thought in mind that the ladies attending the Superintendents meeting would prefer to shop, the committee did not arrange a formal program for them. In addition to the dancing on Friday evening, the reception and banquet on Saturday evening, the ladies enjoyed an informal tea at the hotel on Saturday afternoon.

Registration

• The following men and women registered at the eighth December meeting of the Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association:

• **Mr. and Mrs. C. E. Ackley,** Crown Willamette Paper Co., Division of Crown Zellerbach Corporation, Lebanon, Oregon; **Tore Ahlen,** Svenska-Flaktfabriken, Seattle; **G. F. Alcorn,** Pulp Division Weyerhaeuser Timber Co., Everett; **Mr. and Mrs. Leslie Anderson,** Pulp Division Weyerhaeuser Timber Co., Longview; **Mr. and Mrs. Niles Anderson,** St. Regis Paper Company, Kraft Pulp Division, Tacoma; **I. H. Andrews,** Powell River Company, Ltd., Powell River, B. C.; **Mr. and Mrs. Fred Armbruster,** Great Western Division, The Dow Chemical Company, Seattle; **Mr. and Mrs. C. M. Barr,** Marshall & Barr, Seattle; **Verne Basom,** Fibreboard Products Inc., Port Angeles, Wash.; **R. A. Baum,** Fernstrom Paper Mills, Pomona, Calif.; **Mr. and Mrs. C. B. Baxter,** Tacoma Plumbing Supply, Tacoma.

A. F. Benson, Fibreboard Products Inc., Port Angeles, Wash.; **A. L. Bibbins,** Electric Steel Foundry, Portland; **Myron Black,** Inland Empire Paper Co., Millwood, Wash.; **Louis Blackerby,** Pacific Pulp & Paper Industry, Portland; **Mr. and Mrs. G. S. Brazeau,** Pulp Division Weyerhaeuser Timber Co., Everett; **Robert A. Bremner,** Electric Steel Foundry, Portland; **Martin Breuer,** E. I. DuPont de Nemours & Co., San Francisco; **Mr. and Mrs. Joseph Briody,** Industrial Chrome Plating Co., Portland; **R. E. Brown,** R. E. Chase & Company, Tacoma; **A. M. Cadigan,** St. Regis Paper Company, Kraft Pulp Division, Tacoma; **Claude Callaghan,** Flox Company, Tacoma, **Mr. and Mrs. J. M. Carlson,** Soundview Pulp Company, Everett; **W. C. Chapman,** Ingersoll Rand, Seattle; **R. E. Chase,** R. E. Chase & Company, Tacoma; **R. E. Chase, Jr.,** R. E. Chase & Company, Portland; **Mr. and Mrs. R. E. Cleveland,** Chromium Corp. of America, Waterbury, Conn.; **Mr. and Mrs. Sidney Collier,** Puget Sound Pulp & Timber Co., Bellingham; **R. M. Cooper,** Powell River Company, Ltd., Powell River, B. C.; **N. W. Coster,** Soundview Pulp Company, Everett; **J. V. B. Cox,** Hercules Powder Company, Portland; **Mr. and Mrs. J. A. Cunningham,** Simonds, Saw & Steel, Tacoma; **H. N. Danielsen,** Simonds, Saw & Steel, Portland; **D. B. Davies,** Rayonier Incorporated, Shelton, Wash.; **Mr. and Mrs. Jeff Davis,** Electric Steel Foundry, Seattle; **H. A. DesMarais,** General Dyestuff Corp., San Francisco; **R. E. Drane,** St. Helens Pulp & Paper Co., St. Helens, Ore.; **Mr. and Mrs. Sid Drew,** Drew & Hoffman, Portland; **Mr. & Mrs. A. E. Duke,** Soundview Pulp Company, Everett; **Allan Dunham,** Lockport Felt Company, Portland.

Mr. and Mrs. Erik Ekholm, Puget Sound Pulp & Timber Co., Bellingham; **Mr. and Mrs. R. L. Eminger,** American

A. S. QUINN, Reelected Secretary-Treasurer, Pacific Coast Division

THE MEN who arranged the 1941 Fall Meeting of the Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association.

Left to right, SAM A. SALMONSON, General Chairman of the meeting and Assistant Superintendent, Soundview Pulp Co. (Mr. Salmonson was elected Third Vice Chairman of the Pacific Coast Division); ANDREW D. HAWLEY, Co-Chairman, and in charge of the Seattle office of the Pacific Coast Supply Co.; WALTER A. SALMONSON, Co-Chairman and Washington representative for the Simonds Worden White Co.; and FRED R. ARMBRUSTER, Chairman of Registration, and with the Great Western Division, The Dow Chemical Co., Seattle.

NILES M ANDERSON, Retiring Chairman, Pacific Coast Division

Pulp & Paper Mill Superintendents Association, Miamisburg, Ohio; **E. O. Ericsson,** Puget Sound Pulp & Timber Co., Bellingham; **James Fear,** Gaspesia Sulphite Co., Chandler, P. Q.; **H. Florence,** Pulp Division Weyerhaeuser Timber Co., Everett; **Mr. and Mrs. John M. Fulton,** Pacific Coast Supply Co., Portland; **Mr. and Mrs. Irving R. Gard,** Merrick Scale Mfg. Co., Seattle; **Mr. and Mrs. Donald Grant,** Soundview Pulp Company, Everett; **George G. Guild,** Huntington Rubber Mills, Seattle; **Anton Gustin,** Rayonier Incorporated, Hoquiam, Wash.; **Mr. and Mrs. Ken Hall,** Hesse-Ersted Iron Works, Portland.

L. R. Hartman, Pulp Division Weyerhaeuser Timber Co., Everett; **Mr. and Mrs. A. D. Hawley,** Pacific Coast Supply Co., Seattle; **Mr. and Mrs. Norman Heglund,** Soundview Pulp Company, Everett; **Dr. Allan Hill,** Anglo Canadian Pulp & Paper Mills, Quebec, P. Q.; **Mr. and Mrs. H. F. Hoehne,** Longview Fibre Company, Longview; **Mr. and Mrs. C. F. Holcomb,** Edison Storage Battery Co.,

ROBERT A. BAUM, Presented subject of pulp furnishes

Seattle; **Don Holt,** Pulp Division Weyerhaeuser Timber Co., Everett; **Al Hooker,** Hooker Electrochemical Co., Tacoma; **Mr. and Mrs. C. E. Hulsart,** C. C. Moore & Co., Seattle; **E. O. Hunter,** Bigelow Liptak Corp., Tacoma.

Hannes Jansson, Sunila Co., Sunila, Finland; **Mr. and Mrs. E. R. Johnson,** Contractor, Everett; **Jack Johnson,** Appleton Woolen Mills, Portland; **Ray Johnson,** Pulp Division Weyerhaeuser Timber Co., Everett; **Mr. and Mrs. W. T. Kay,** E. J. Bartells Co., Seattle; **R. L. Kettenring,** Rayonier Incorporated, Tacoma; **G. J. Kiffer,** C. C. Moore & Co., Seattle; **C. R. Koch,** Westinghouse Electric & Mfg. Company; **Robert M. Kuhn,** St. Regis Paper Company, Kraft Pulp Division, Tacoma; **G. Kulvick,** Enso-Gutzeit Corp., Enso, Finland.

Mr. and Mrs. R. J. LeRoux, Pulp Division Weyerhaeuser Timber Co., Everett; **Mr. and Mrs. Foss B. Lewis,** Simonds Saw & Steel, Portland; **J. R. Lewis,** Anacortes Pulp Company, Anacortes, Wash.; **Mr. & Mrs. N. A. Lewthwaite,** Crown Zellerbach Corp., Port Townsend, Wash.; **Mr. and Mrs. A. H. Lundberg,** A. H. Lundberg Co., Seattle; **Mr. and Mrs. D. K. MacBain,** Pulp Division Weyerhaeuser Timber Co., Longview; **Mr. and Mrs. C. J. McAllister,** Simonds Worden White, Portland; **Mr. and Mrs. J. H. McCarthy,** Soundview Pulp Company, Everett.

Mr. and Mrs. G. H. McGregor, Pulp Division Weyerhaeuser Timber Co., Longview; **Mr. and Mrs. L. McMaster,** Asten Hill Mfg. Co., Portland; **Joe McQuaid,** Griffith Rubber Co., Portland; **Mr. and Mrs. R. W. Martig,** Brown Instrument Co., Portland; **Jack Martin,** Schorn Paint Co., Seattle; **Mr. and Mrs. K. M. Milligan,** Northwest Lead Company, Seattle; **Mr. and Mrs. T. E. Moffitt,** Hooker Electrochemical Co., Tacoma; **C. W. Morden,** Morden Machines Co., Portland; **Mr. and Mrs. Doug Morris,** James Brinkley Company, Seattle; **Austin Nickels,** Hawley Pulp & Paper Co., Oregon City, Ore.; **S. Norman,** Portland.

Merrill E. Norwood, Columbia River Paper Mills, Vancouver, Wash.; **Mr. and Mrs. J. G. O'Brien,** Soundview Pulp Company, Everett; **F. A. Olmsted,** Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas; **Jim Osborne,** General Chemical Co., Portland; **W. N. Osborne,** Hooker Electrochemical Co., Tacoma; **Mr. and Mrs. Gus Ostenson,** Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas; **R. T. Petrie,** Black Clawson Co., Portland; **Mr. and Mrs. J. H. Quigley,** Crown Zellerbach Corp., Port Townsend, Wash.; **W. D. Rigg,** Longview Fibre Co., Longview; **E. M. Root,** Dilts Machine Works, Fulton, N. Y.; **G. D. Ross,** St. Regis Paper Company, Kraft Pulp Division, Tacoma.

James Ruck, St. Regis Paper Company, Kraft Pulp Division, Tacoma; **Mr. and Mrs. H. R. Russell,** Everett Pulp & Paper Co., Everett; **Mr. and Mrs. S. A. Salmonson,** Soundview Pulp Company, Everett; **W. A. Salmonson,** Simonds Worden White, Seattle; **Mr. and Mrs. Harlan Scott,** Pacific Pulp & Paper Industry, Seattle; **Mr. and Mrs. Brian Shera,** Pennsylvania Salt Manufacturing Company of Washington, Tacoma; **Mr. and Mrs. C. Sholdebrand,** Hawley Pulp & Paper Co., Oregon City, Ore.; **Mr. and Mrs. Anton Siebers,** Longview Fibre Company, Longview; **C. V. Smith,** St. Helen Pulp & Paper Co., St. Helens, Ore.; **J. F. Smith,** Great Western Division, The Dow Chemical Co., San Francisco; **Larry Smith,** Pacific Pulp & Paper Industry, Seattle.

Ray Smythe, Rice Barton Corp., Portland; **E. E. Stephens,** Bumstead-Woolford; **J. P. Strasser,** Stein Hall Co., Inc., Chicago; **J. B. Symonds,** Sinclair Wire Co., Seattle; **Mr. and Mrs. Earl G. Thompson,** Great Western Division, The Dow Chemical Co., Seattle; **E. H. Tidland,** Pacific Coast Supply Co., Portland; **V. L. Tipka,** Hawley Pulp & Paper Co., Oregon City, Ore.; **John L. True,** Saginaw, Mich.; **R. M. True,** General Dyestuff Corp., Portland; **James Turek, Jr.,** Stein Hall Mfg. Co., Portland; **H. A. Vernet,** A. E. Staley Mfg. Co., San Francisco.

Mr. and Mrs. A. S. Viger, Rayonier Incorporated, Shelton, Wash.; **R. O. Vognild,** Hooker Electrochemical Co., Tacoma; **L. H. Wear,** Taylor Instrument Co., Portland; **Mr. and Mrs. Fred V. Wellington,** Western Gear Works, Seattle; **Jack Wilcox,** Electric Steel Foundry, Portland; **J. A. Wilson,** Hawley Pulp & Paper Co., Oregon City; **Z. A. Wise,** Griffith Rubber Mills, Portland; **E. P. Wood,** Pulp Division Weyerhaeuser Timber Co., Longview; **L. F. Wray,** Simonds Saw & Steel Co.

Eminger Attends Superintendents Meeting

● Robert L. Eminger, secretary-treasurer of the American Pulp & Paper Mill Superintendents Association, with headquarters in Miamisburg, Ohio, attended the meeting of the Pacific Coast Division in Seattle, December 5th and 6th. Mrs. Eminger accompanied him on the trip, their first to the Pacific Coast.

Following the meeting they went to Longview for a visit with Mr. and Mrs. H. R. Heuer. Mr. Heuer, shift superintendent, Longview Mill, Pulp Division Weyeraeuser Timber Company, has been active in the Superintendents Association for many years and was the first chairman of the Pacific Coast Division when it was organized in the Fall of 1933.

From Longview Mr. and Mrs. Eminger traveled to San Francisco where they were shown the city by Mr. and Mrs. H. A. Des Marais. Mr. Des Marais was the first secretary-treasurer of the Pacific Coast Division and served several terms.

After a visit in Los Angeles, Mr. and Mrs. Eminger headed home toward Miamisburg by way of Boulder Dam, Salt Lake City, and Denver.

Mr. Eminger has been secretary-treasurer of the Superintendents for more than 17 years, having taken office May 24, 1924. Prior to 1924 he was in the superintendent's office of the Miami Paper Company, now the Oxford-Miamia Paper Company, for six years under Superintendent Herbert Server.

Edwards and Hatch Talk To Paper School

● Lowell Edwards, assistant p'ant engineer, Longview Mill, Pulp Division Weyerhaeuser Timber Company, Longview, Washington, lectured to the fourth-year students of the Camas Paper School, of Crown Zellerbach Corporation, Camas, Washington, on November 26th. His subject was "Principles of Hydraulics, Pumps and Pumping."

R. S. Hatch, research director for Weyerhaeuser Timber Company, lectured to the first-year students of the Camas Paper School December 9th. "Pulp Bleaching" was his subject.

Wire Life

by GUS OSTENSON*

WHEN one makes the statement to the paper maker that "we just lost a wire" it is about the most tragic news possible. Why? It means instant stoppage of production that is so important in times such as we are now having.

It means the loss of expensive equipment that not only results in loss of production but has a direct bearing on the cost of the finished product. Crews of men must be brought in to replace this vital part of the paper machine, and this again increases cost. There is the worry and concern of how the wire was "lost," and the necessity of correcting the fault so as not to have a recurrence of the same trouble.

Through excellent cooperation between the Technical, Operating and Purchasing departments, we have been able to make a working record of why wires are "lost." In the Shibley award winning paper, "The Measurement of Wire Wear and Wire Life," presented by Milton Franklin of our technical staff at Camas before the Pacific Section of TAPPI in Portland, October 8th, 1940, the causes for removal of 116 wires were reported as follows:

1. Seam failure, 10.
2. Cracks, edges and center, 40.
3. Holes, 27.
4. Damaged, 12.
5. Ridges, 5.
6. Special grades requiring certain wires, 5.
7. Reasons not recorded, 4.
8. Actual worn out, 13.

Through the work of our technical department, we were able to definitely determine the percentage of wear on each wire, as well as, a record of miles run per foot of wire.

A record is also kept of days, life and tons per wire.

We know, of course, when a wire has to be removed, but it is interesting to know whether or not we are getting normal or excessive wear—whether it is a hard or soft wire. These aspects readily show up in the percentage-of-wear figures.

Now since we have accumulated the information on what happened to these 116 wires, it was necessary to change and improve conditions so as to have more wires in the worn out class. In order to do this, a day-by-day record on each individual wire was kept to show when wire was trimmed; if ridges appeared; whether they were inside or outside ridges, and from what source; whether the wire became pitted or bulged and the reason. This required a close scrutiny of each wire each day and also close inspection each time the machine was down for washup or a grade change.

Training Personnel

● The first step in cutting down the amount of wire damage is the proper training of personnel and provision of adequate supervision in installing new wires on the machine. A paper machine wire is so easily damaged that any undue pressure brought against it while in the process of being installed will cut short its life by many days. Machines without removable fourdriniers increase the hazard since the strongbacks, table rolls, shower pipes, savealls, etc., are sometimes dropped in handling and the wire damaged. At other times the men's shoulders and arms kink wire edges, later causing cracks. Care must be used in unrolling the wire and removing the poles so as to prevent kinks and wrinkles. Perfect alignment on the breast roll and couch must be made to insure a straight running wire. This, in turn, eases the job the guide has to do.

GUS OSTENSON, Presented Paper On "Wire Life"

Assuming that the wire has been installed in A-1 condition, normal life can be expected unless something else happens—and I'm sure you will agree that it sometimes does happen.

Seam failure—very little can be accomplished at the mill on this item, but wire manufacturers are improving seams, and this trouble seems to be on the decline.

Cracks—any number of reasons cause cracks in the wire edge, and in spite of improvements, we do not seem to be able to eliminate all of them. Some of the reasons for cracks are:

1. Bending or kinking the edge while putting on the wire.
2. Chunks of grease from the table or wire roll bearing.
3. Excessive weight of deckle straps or improper spacing of rolls so straps rest on the wire with too much strain.
4. Water pressure against the edge of the wire when machine men are hosing the wire off.
5. Riding of dandy roll too hard on wire.

These are a few of the causes, but the best remedy is the periodical grinding of the breast roll, couch roll, wire carrying rolls, and even table rolls, since the edges of these rolls soon become high and put undue tension on the edge of the wire.

Holes—holes like cracks are a papermaker's curse. Although the causes are many, most holes are the result of wear on pits and bulges. These pits or bulges are caused from:

1. Improper screening or too many obstructions in head box allowing large and hard particles to pass under lump breaker roll or top couch.
2. Water containing large particles of sand and dirt either in shower water or make-up water.
3. Iron strongbacks, doctors, or truss rods where rust can accumulate and drop onto the wire.

To correct conditions that cause holes, it is necessary to eliminate all iron upon which there is a possibility of rust accumulating and dropping on the wire. This is particularly essential in regard to iron pipe used either in shower or make-up

*Paper Mill Superintendent, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington. Presented at the meeting of the Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association, Seattle, Washington, December 6, 1941.

system. We have found that after cleaning pipes on a machine equipped with iron pipe, pitting shows a decided increase, and on fine wires this pitting certainly reduces wire life.

Ridges—By proper doctoring of rolls, this can be pretty well controlled except for ridges caused from worn suction boxes, wax or size accumulation on boxes, leaky savealls, and burrs on table rolls or forming boards. While the most important rolls to be doctored are the first return roll or doctor roll after couch and the breast roll, the other rolls also should be equipped with doctors. Any number of doctor blade materials may be used depending on mill conditions. Among those used are hard rubber, soft rubber, micarta, eelslip, wood, and stainless steel. It is imperative that the doctor fit the roll perfectly in all instances. This means that a roll should be ground before installing a new doctor, but after a doctor has been fitted perfectly, it will run one, two, or three years before it will be necessary to renew it. Wire showers play an important part in lubricating doctors as well as cleaning the wire. Their position in relation to rolls and doctors is open for argument since successful operation is obtained from several positions.

Damaged Wires Major Problem

● Damaged wires are our biggest heartache. Among the causes we have experienced are: Wire guide failure, sheet following pickup felt, pickup or Harper felt wrinkling causing wrinkles in the wire, dropping equipment on the wire or in the headbox, wire roll bearing failure, bolts or nuts crystallizing and falling on to the wire off slice or fourdrinier, and even passers-by tossing apple cores into the wire instead of drain ditch. Then when you think that you have them all catalogued, something else will happen. To cut down damaged wires, it is necessary that everyone connected with the mill know how frail a wire is, particularly machine men and mechanics. Steel drillings or chips of concrete raise havoc with wires in a very short time. It would pay to change bolts and screws in the head box, slice and fourdrinier periodically before they break and fall into wire due to crystallization.

It is sometimes necessary to remove wires due to the necessity of manufacturing special grades. That is, a wire which might have been run for considerably longer time on a medium or heavy weight paper will not allow efficient production on a light weight tissue or a highly hydrated sheet; hence it must be removed.

Since paper machines are of such a variable nature, being different mechanically and making different grades under different conditions, it is impossible to compare wires on one machine with those of another machine. Comparisons should be made, instead, between wires on the same machine.

Wire manufacturers have improved their wire construction in the past few years so that it is now possible to run twill-weave or long-crimp type weave on almost all grades. This in itself contributes to longer wire life. In addition, seams on this type of wire have improved generally.

Due to higher speeds and improved quality, wires must be better. A small hole or a ridged wire that may have given several more days life in the past must now be removed. Paper machine conditions must also keep pace; rolls must be balanced for higher speeds, doctors must fit better, dandy rolls have to be truer, and cleaning showers must be of improved design and type.

Since wires are made from a vital defense material, it behooves us all to do everything possible to improve wire life. With paper becoming more and more vital to defense needs, we must weigh the problem carefully so as to maintain good production and still get good wire life.

British Columbia Pulp Paying Bond Interest

● British Columbia Pulp & Paper Company has notified holders of the 7 per cent general mortgage sinking fund bonds that coupons due May 1 and November 1, 1941, will be paid on December 29, together with interest on interest.

For each $1,000 bond, the May 1st coupon will be worth $36.32 and the November 1 coupon $35.40.

Action along these lines indicates a further substantial improvement in the company's earning power. Under the arrangement with bondholders, interest payments were postponed until November 1st, 1942. The company, however, retained the right to make pre-payment from time to time on thirty days' notice.

Arrears of interest at the end of 1940 amounted to $860,445, excluding interest on bonds held by the company.

Bakewell Now In England

● Ernest Bakewell, technical engineer for Pacific Mills and later at Powell River Company in British Columbia, is now in England managing one of the biggest explosives plants in the British Empire, according to advices from London.

Mr. Bakewell served a term in the British Columbia legislature some years ago.

McMaster To Represent Chromium Corporation

● While Ralph E. Cleveland, manager of the Chromium Corporation of America's Waterbury, Connecticut, plant, was on the Pacific Coast early in December, he announced the appointment of Leonard McMaster of Portland as Pacific Coast representative.

Mr. McMaster, for nine years assistant to the president of Asten-Hill Manufacturing Company of Philadelphia, moved to Portland in November to represent several of the accounts handled by the late Walter Hodges, Asten-Hill dryer felts, Orr woolen felts and American Wringer rubber rolls (See page 15, November, 1941, issue).

Mr. Cleveland, accompanied by Mrs. Cleveland, arrived in Portland November 30th. Before and following the Superintendents meeting in Seattle, which they attended, he called upon a number of Pacific Northwest mills with Mr. McMaster.

Liking the Pacific Coast very much, Mr. Cleveland said he regretted he had to start back on December 12th but work at Waterbury necessitated his early return after a brief visit to San Francisco and Los Angeles.

"The Chromium Corporation of America is concentrating on essential production during the emergency," said Mr. Cleveland, "and it considers the pulp and paper industry in that category."

The Chromium Corporation's large plant at Waterbury was the original chromium plating plant. There the first auto trim and plumbing fixtures were plated and likewise the first pulp and paper mill equipment. The company now plates screen plates, flat plates, seal rolls, press rolls, suction covers and dryers. It is well equipped and can handle parts up to 12 feet in diameter and 22 feet in length.

The Chromium Corporation developed the "Open Back" screen plate and the "Open Grain" press roll.

Mr. Cleveland has been manager of the Waterbury plant since 1926 and prior to that was superintendent of the large Westinghouse Lamp Works in New Jersey.

RALPH E. CLEVELAND, Manager, Chromium Plating Plant at Waterbury, Conn.

Berkheimer Honored By Arbitration Association

● The American Arbitration Association, through its president, Cornelius Vanderbilt Whitney, announced October 2nd, that J. E. Berkheimer of Tacoma, Washington, has been honored by appointment to the National Panel of Arbitrators of the arbitration association.

Mr. Berkheimer, an expert in the field of composition roofing manufacturing, is the president of the J. E. Berkheimer Manufacturing Company. He is well known in Tacoma, being a trustee of the Tacoma Elks Club, a member of the Board of the Dash Point Water Department and a charter member of the Tacoma Rotary Club.

In order to expedite the immediate settlement of any commercial or industrial disputes which might delay fulfillment of National Defense contracts and thereby hinder National Defense, the American Arbitration Association is adding to its National Panel of Arbitrators throughout the country.

The arbitration association, a nonprofit organization, has offices in thirty-one of the key national defense cities of the country. While their nearest office to Tacoma is Seattle, they have over eight thousand qualified leading citizens—experts in their particular fields—who are available to act as impartial arbitrators in more than sixteen hundred cities throughout the United States. The national offices of the association are located at Rockefeller Plaza in New York City.

Everett Pulp & Paper Helps Local Defense Plans

● The Everett Pulp & Paper Company of Everett, Washington, has given the medical unit of the Everett Civilian Defense Organization sufficient old papermaking felts to take care of all the requirements for Blankets.

"This cooperation means a saving of approximately $1,200 to the community," stated George Tozer, in charge of supplies for the defense organization.

New Coast TAPPI Members

● The executive committee of the Technical Association of the Pulp & Paper Industry has elected the following Pacific Coast men to membership:

M. Lowell Edwards, assistant plant engineer, Longview Mill, Pulp Division Weyerhaeuser Timber Company, Longview. Mr. Edwards is a 1924 graduate of Oregon State College.

Donald L. Erickson, chemist, Oregon Pulp & Paper Company, Salem, Oregon, is a 1939 graduate of Oregon State College, and was with the Longview Mill, Pulp Division Weyerhaeuser Timber Company, before becoming associated with the plant at Salem.

James Ruck Joines Superintendents

● James Ruck, assistant superintendent, St. Regis Paper Company, Kraft Pulp Division, Tacoma, Washington, recently became a member of the American Pulp & Paper Mill Superintendents Association.

TAPPI Will Discuss Lime At Longview Meeting

Pacific section will meet at the Hotel Monticello the evening of January 6th — G. H. Galloway serving as chairman.

● The January 6th TAPPI dinner meeting will be held at the Monticello Hotel, Longview, Washington, and will feature a discussion of the manufacture of lime and its use in pulp and paper manufacturing processes. The tentative outline is as follows:

1. Manufacturing and processing of lime as applied to its physical and chemical characteristics and physical and chemical behavior.
2. Consideration of bleach liquor, from all angles.
3. Use of lime in the kraft recovery system.
4. Some of the newer methods of handling lime.

Men serving on the panel will include Lloyd Ewing, of Longview Fibre Company, Longview, Washington; Wolf Bauer, Washington Brick, Lime & Sewer Pipe Company, Spokane, Washington; Walter Jacoby, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas; A. M. Cadigan, St. Regis Paper Company, Kraft Pulp Division, Tacoma; Jerry Alcorn, Everett Mill, Pulp Division Weyerhaeuser Timber Company, Everett; and G. H. Galloway, assistant technical supervisor of Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, will serve as chairman.

Mr. Galloway has mailed questionnaires to the mills on the use of lime in bleaching and kraft recovery. The final outline for the January 6th discussion will be based upon answers received.

Ben Natwick to Represent Appleton Wire Works

● Ben E. Natwick has been appointed Pacific Coast representative for the Appleton Wire Works of Appleton, Wisconsin, succeeding the late Walter E. Hodges.

The announcement was made last month by William E. Buchanan, president and treasurer of the Appleton Wire Works. Mr. Natwick is now at the company's plant in Appleton and will move to Portland with Mrs. Natwick around the first of the year.

Ben Natwick is the son of Mr. and Mrs. A. G. Natwick of Camas. His father, "Buff" Natwick, is assistant manager of the Camas mill of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation.

In 1938 he graduated from the College of Forestry, University of Washington, Seattle, having majored in Forest Products. Ben Natwick's contact with the pulp and paper industry began long before he went to college, starting in 1931. During summer vacations he worked in the pulp mill, paper mill, converting plant and technical control department of the mill at Camas.

Upon his graduation from the University of Washington in 1938 he went with the Celotex Corporation in Chicago in the research engineering department, engaging in technical service work.

BEN E. NATWICK, Representing Appleton Wires.

Rayonier Reports Increased Volume, Lower Profit

Increased taxes reduce net profit—Sales of pulp and papers total 198,491 tons in first six months of fiscal year against 175,616 tons in same 1940 period—Rayonier pulps playing important part in National Defense.

RAYONIER INCORPORATED and its wholly owned subsidiary, Georgia Timber Company, for the three months ended October 31, 1941 (second quarter of the current fiscal year), report consolidated net profit of $935,760 after all charges, including federal income and excess profits taxes of $1,343,467. This is equivalent, after dividend requirements on the preferred, to 65 cents a share on 963,871 shares of common stock and compares with consolidated net profit of $843,983 for the preceding three months, equal to 54 cents a share on the common, and with $1,053,557 or 77 cents a share for the quarter ended October 31, 1940.

Consolidated net profit for the six months ended October 31, 1941, totaled $1,770,743 after all charges, including $2,552,804 provision for federal income and excess profits. This is equal after preferred dividend requirements, to $1.19 a share on the common, and compares with $2,139,109 or $1.57 a share on common in the like 1940 period.

Of the consolidated net profit for the six months ended October 31, 1941, $1,108,140, or 62.6 per cent was paid out in dividends to stockholders. In addition to the payment of these dividends the Company prepaid an addional $1,000,000 of its long-term bank loans during the period, reducing the amount outstanding as of October 31, 1941 to $4,000,000.

Reflecting the continuing high rate of activity in the domestic rayon industry, sales of dissolving pulps to customers in the United States during the six months just ended amounted to 97,326 tons, as against 68,476 tons for the like period of 1940, setting a new high record for any half-year period in the company's history.

Continued High Operating Rate Predicted

● Total tonnage sold, including paper grade pulps and fine papers, amounted to 198,491 tons in the first six months of this year compared with 175,616 in the corresponding period of the preceding year. No sales were made to Japan in 1941, compared with 34,196 tons to that country in the 1940 fiscal period. As a result total dissolving pulps sold dropped to 103,722 tons in the six months ended October 31, last, as against 126,553 in the corresponding period of last year. Offsetting this decrease and bringing total of all classes of pulp sold to a point above 1940 was the sharp gain in paper grade pulps which recorded sales of 81,607 tons in the first half of the current year, compared with 39,487 tons in the like period of 1940.

Capacity operations were predicted for some time to come by Edward M. Mills, president, who said: "The domestic demand for wood pulps of all types together with the necessity for American producers to supply certain foreign markets, has been such as to tax the manufacturing facilities of the entire industry. To the normal requirements, which have been increasing as a result of improved economic conditions, there has been added a growing volume of demand directly traceable to the national defense program. It would appear that such conditions will prevail for some time to come. As a matter of fact, despite the all-out effort being made by the industry, there exists a possibility of a shortage of certain types of pulps."

Current Position

● Balance sheet of Rayonier Incorporated, as of October 31, 1941, shows total current assets of $10,657,609, and current liabilities of $6,095,801, indicating working capital of $4,561,808 and a current ratio of 1.7 to 1. A year earlier current assets were $7,421,554 and current liabilities $3,504,989, indicating working capital of $3,916,565 and a current ratio of 2.1 to 1.

Consolidated condensed income account of Rayonier Incorporated, and its wholly owned subsidiary, Georgia Timber Co., prepared by the company without independent audit, compares as shown for the three months ended October 31, 1941:

	Quarter ended		
	Oct. 31, '41	July 31, '41	Oct. 31, '40
Profit from operations	$2,711,568	$2,474,471	$2,611,868
Depltn and depctn	389,829	390,529	383,053
Other expenses (net)	42,521	39,622	180,705
Prov for fed income tax	438,060	357,973	491,682
Prov for fed excess pfts tax	905,407	851,364	502,871
Net profit	$935,760	$834,983	$1,053,557

Rayonier's condensed consolidated income account for the six months ended October 31, 1941, compares as shown with the like periods of the two preceding fiscal years:

	Six months ended		
	Oct. 31, '41	Oct. 31, '40	Oct. 31, '39
Profit from operations	$5,186,039	$5,144,939	$1,789,063
Depctn and depltn	780,349	761,960	576,350
Other expenses (net)	82,143	320,047	170,864
Prov for fed income tax	796,033	976,004	171,697
Prov for fed excess pfts tax	1,756,771	948,089	----------
Net profit	$1,770,743	$2,139,109	$870,152

The tonnage of pulps and papers sold by Rayonier Incorporated in various markets during the six months ended October 31, 1941, and October 31, 1940, is compared in the accompanying tabulation.

	U.S.A.		Japan		Other Countries		TOTAL	
	1941	1940	1941	1940	1941	1940	1941	1940
Dissolving Pulps	97,326	68,476	None	32,856	6,396	25,221	103,722	126,553
Paper Grade Pulps	65,047	28,918	None	1,340	16,560	9,229	81,607	39,487
Fine Papers	10,233	6,300	None	None	2,929	3,276	13,162	9,576
Total Tonnage	172,606	103,694	None	34,196	25,885	37,726	198,491	175,616

Six months ended October 31:	1941	1940
Total production, tons	184,293	178,186
Total sales, tons	198,491	175,616
Profit before federal income taxes	$4,323,547	$4,063,202
Federal income taxes	2,552,804	1,924,093
Consolidated net profit	1,770,743	2,139,109

Wood Pulp In National Defense

"The national defense effort has first call on the resources of the nation," says the Rayonier Incorporated quarterly report. "This applies not only to materials but also to men and manufacturing facilities. In a world torn by war, America must pour out its wealth and energy to build armies and navies, airplanes and tanks, ships and submarines. These are the front lines of our defense.

"Behind these armies and armaments, the nation must continue to live and work. And American industry is doing everything in its power to continue supplying the nation's normal requirements while going ahead with the gigantic task of handling defense needs. However, there are bound to be some shortages and scarcities, and the great majority of

Americans will have to do without some of the things they are accustomed to having and get along with less of other things. Among these things may be included some of the materials and products made from wood pulp.

Playing An Important Part

● "Directly and indirectly, wood pulp is playing an important part in the national defense program and appears destined to become increasingly in demand for defense purposes. Its greatest use in this connection is, of course, in the manufacture of the various kinds of paper and paper products which are required by the government both for consumption at home and for aid to other countries under the Lease-Lend Act. Vast quantities of paperboard are needed for shipping cases, cartons, and other containers, for the packaging and transport of foodstuffs, defense and war materials. In addition, the government is using thousands of tons of such items as blueprint, mimeograph, writing and printing papers, and of wrapping and bag papers. The consumption of many other kinds of paper also has increased as a result of the defense effort.

In the Front Line

● "Wood pulp not only is serving behind the lines, but has taken its place in the front line of defense. As a raw material for rayon it is contributing to the manufacture of the rayon cord tires which are being increasingly used on airplanes, trucks, gun carriages, and so forth. The world's largest airplane, the Douglas B-19, is equipped with specially made tires of this type. The two main tires on this super bomber measure 8 feet each in diameter, making them the largest tires in the world. The nose tire measures 4½ feet. Each of the larger tires contains nearly 150 miles of rayon cord.

"Rayon undoubtedly will have many other uses in national defense. A recent issue of one of the leading textile publications stated: 'Army raincoats of treated rayon are being experimented with and are soon to be purchased as standard equipment.' Experiments and tests in connection with various other kinds of military apparel also are being conducted, as are tests with regard to rayon parachutes. It would appear practically certain that rayon will be extensively used for these purposes.

Military Propellant Powders

● "Another important use for wood pulp of the type which goes into the manufacture of rayon is the production of military propellant powders. The base of these powders is purified cellulose, of which highly refined bleached sulphite wood pulps, or "dissolving" pulps, provide a satisfactory and economical source. Aside from the needs of our own government in this respect, considerable quantities of wood pulp are being shipped to England for this purpose.

"Dissolving pulps also are assisting in the construction of ships. Most of the ships that are being built today are of welded construction, and require the use of large quantities of welding rods. These rods are coated with a flux which contains wood pulp.

Other Uses

● "There are a number of other ways in which wood pulp is contributing to national defense, among which may be mentioned its use in the manufacture of synthetic resin molding powders, plastics, vulcanized fibre, lacquers, and photographic papers.

"Synthetic resin molding powders are used for push buttons for radios, insulating parts, electrical and mechanical equipment, airplane parts and so forth. Plastics and vulcanized fibre have a great many uses, including radio and airplane equipment, silent gears, electrical switches and electrical insulating parts for motors.

"As the leading United States manufacturer of dissolving pulps, with four mills in the State of Washington and one in Florida, Rayonier is supplying an important part of the demand for these pulps for both defense and civilian requirements. The company also is supplying large quantities of pulp for use in the manufacture of certain kinds of paper. Together with thousands of other individual units of American industry, the company is extending full cooperation to accelerate our great National Defense Program."

St. Helens Reports Good Ten Months

Report occasioned by issuance of voting trust certificates for 25,000 shares of common stock heretofore held privately.

● The St. Helens Pulp & Paper Company's net profit for the first ten months of 1941 is indicated at $375,876 or $1.88 a share by data contained in the prospectus on the November 25th public offering of voting trust certificates for 25,000 shares of the company's $10 par value common stock. This showing is after provision for federal income taxes under the Revenue Act of 1941. Sales for the ten months were $3,709,843, according to the prospectus.

The voting trust certificates are said to be a part of the holdings of St. Helens stock of the late E. S. Collins of Portland.

St. Helens operates a sulphate pulp and paper mill at St. Helens, Oregon, together with an extensive bag converting operation. Paper is also supplied to Bemis Bros. heavy duty multiple-wall bag plants located at St. Helens and Wilmington, California. The Graham Paper Company, with headquarters in St. Louis and offices in Seattle, Portland, San Francisco and Los Angeles, handles the sales of the company's products, exclusively.

The certificates for the 25,000 shares are being offered at $21.75 a share by an underwriting group headed by Blyth and Company, Inc., and including Dean Witter & Co., Ferris & Hardgrove, Hemphill, Fenton & Campbell, Inc., E. M. Adams & Co., Blankenship & Gould, Inc., Warrens, Bosch & Floan, Atkinson, Jones & Co., and Camp & Co., Inc. These shares do not constitute a new issue but were heretofore held privately. Outstanding capitalization consists solely of 199,934 common shares.

For 1940 the company reported a net profit of $414,059, or $2.07 per share. Sales for the year were $3,452,291.

Paper Economy Ideas

● "In the interests of paper conservation, " editorializes the Palo Alto, California, "Times," "government press agents at Washington have been ordered to write their copy on a single space basis, instead of leaving spaces between the lines, and also have been told to use both sides of the paper.

"The newspapers, which are destined to to be the ultimate recipients of those mimeographed handouts, will look with horror upon those new regulations. Double spacing of copy is important for subheading and editorial interlineation. The order to write on both sides of the paper proceeds from lack of practical appreciation of methods in the newspaper composing room, where it is necessary to tear copy into 'takes' for distribution among various linotypes working simultaneously for speeding the typesetting.

"If the government really wants to economize on paper and is interested in a newspaper's suggestions in that connection, we have a couple to offer. One, send out less of the handout material. Two, abandon the custom of 'extending remarks' in the Congressional Record—a custom which admits to its pages all sorts of extraneous matter that was never included in the spoken adresses."

An Investigation of the Effect of Mixed Pulp Furnishes on Sheet Properties

by ROBERT A. BAUM*

ABSTRACT

The effect on sheet properties of mixing differing grades of domestic unbleached sulphite before treatment is compared to the effect of blending the same stocks after individual treatment.

A guide is derived to aid in calculating the sheet characteristics that may be arrived at by treatment of a mixture, or by individual treatment of each pulp followed by blending.

LABORATORY tests on the various phases of stock preparation by means of small batch beating equipment and handsheet testing can easily be performed to give very indicative results. This is not enough, however, unless these results can be correlated to actual machine operation with a reasonable degree of accuracy.

Due to the wide differences in treating machinery of even identical make and type, correlation of laboratory results with machine performance is still a very flexible relationship, and correlation of one laboratory's results with another mill is even more so.

In this connection this paper deals with two things: Primarily an indication of pulp action under various conditions that any mill using a blend of domestic unbleached sulphite pulps might experience; and, secondly, an attempt to narrow the difference between laboratory results and actual machine results by an analysis of some of the variables that enter into such a relation. The latter being considered first.

Much work has been done on this subject and many factors have been arrived at which laboratory technicians use in attempting to correlate their results with their mill. Oftentimes such a procedure leaves a wide gap in results because individual laboratory tests may vary as much with laboratory beating machinery as do the larger treating elements of individual mills.

Consequently, almost every laboratory must determine for itself the exact extent of the relationship between its results and machine results, and then the various stock preparation formulae derived by other laboratories can be applied more successfully.

In this connection, it is best to adopt the technique that fits the particular set of paper making machinery in question, rather than to follow a method derived for a totally different situation. Any man who has run a machine realizes the tremendous difference between two machines of identical type sitting side by side in the same mill. It is a rare occasion when their action is similar. This is also true of attempting to apply a laboratory analysis, accurate as it may be.

This paper is divided into two parts: Part one deals with certain methods of correlating a laboratory test result to a certain machine condition. Part two deals with the condition to be correlated; namely, domestic unbleached sulphite pulp blending before treatment as opposed to blending after each has been indiviudally treated.

Part One: Result Correlation

Oven-Dry Burst and Conditioned Burst

● In the past, some use has been made of a constant or factor to be applied to the mullen test when it is burst in the oven-dry condition, as opposed to the same test performed on a sheet that is at standard conditions of temperature and humidity.

The use of such a factor in arriving at sheet strength developed by the Valley laboratory beater is often misleading, depending upon the purpose for which it is to be used.

A constant relationship between hot burst and conditioned burst cannot be established. The relation varies with the type of pulp from soft to hard, the freeness range at which the sheet is made, and the room conditions under which the hot burst test is performed.

At short treatment intervals or high freeness range, a sheet that is burst in the oven-dry condition will give a higher value than a sheet burst under standard conditions. As the freeness becomes lower, this relation changes to the exact opposite and at low freeness and long treatment time, the hot burst is lower than the conditioned value. The ratio also changes for each individual pulp, and even further for each cook.

This relationship for two unbleached sulphite pulps is given in Table 1.

From this table it can be seen that any blanket correction factor for hot handsheets can be good at only one freeness value and for the one pulp on which it is determined. Consequently the use of such a factor may lead to errors in attempting correlation to machine results.

Weight of Handsheets

● Standard procedure in making of handsheets for correlation purposes is usually to correct the standard weight handsheet to a one-hundred pound basis. This type of correlation may lead to error in that it assumes that mechanical linkage of fibers and chemical bonding is a property in direct proportion to the amount or thickness (weight) of fibers present. Actually this effect is an increasing ratio rather than a constant one.

A ten-pound handsheet upon being corrected to the one-hundred-pound basis will give a much lower result than a twenty-pound handsheet so corrected. As again, a twenty-pound sheet will give a lower corrected value than a thirty-pound sheet. At forty pounds this increasing ratio ceases to exist and thereafter the relation becomes constant. This factor varies again with the amount of treatment or indicated freeness. In the high freeness ranges the difference is less for a given condition of correction than in the lower freeness range where it becomes greater.

In attempting to correlate handsheet results against each other, sheets should be made in the constant correction range of forty pounds or above, as is the standard procedure. However, in correlating handsheets of forty pounds with machine sheets of, for instance, ten pounds; a considerable error can be introduced.

This may be reduced by the formation of handsheets at the same weight as machine conditions, or by

*Chief Assistant Chemist, Fernstrom Paper Mills, Inc., Pomona, California. Presented at the December, 1941, meeting of the Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association, New Washington Hotel, Seattle, Washington, December 6, 1941.

a correction factor arrived at by an analysis of the pulp or pulps under consideration.

This relation between corrected handsheet weights and tested strength is shown in Graph 2.

Part II: Unbleached Sulphite Mixtures

● The primary purpose of this investigation is to determine the differences that may be expected from treating a mixture of pulps of varying grades and properties under two methods. Limiting the grades within the range of normal unbleached sulphite but not within the range of special pulps used for fillers, etc. First when treated in the mill treating elements after the mixture has been made. Second, when each pulp in the furnish is treated individually and blended in certain percentages just before it enters the machine.

As may be expected, when a pulp of a maximum mullen of 140 is mixed in equal amounts with a pulp of a maximum mullen of 100, the resultant mixture after treatment does not strike an average of 120 but arrives at a strength that is dependent upon three factors: one, pre-treatment blending or after treatment blending. Two, the percentages of differing pulps present; and three, the hardness, beating and hydration rate, or bleachability of the pulps in the mixture.

For purposes of simplification two Pacific Coast unbleached pulps were used in the following analysis. One a fairly hard pulp of high maximum mullen and bleachability, and another softer pulp of lower maximum mullen and lower bleachability.

In order to eliminate the chances of error due to variations in rate of treatment, a trial run was made on these two pulps at a slow rate of development and at a faster rate to determine if rate of treatment can be considered an influencing factor.

Apparently the two pulps maintained the same relationship to each other under the two beating rates. See Graph 3. This would not be true, of course, under extremely drastic conditions of treatment, but for the purposes of this analysis this factor can be assumed to have no influence upon the results obtained.

Mixture of Pulp Before Treatment

Mullen

● The two pulps used in this test were run according to TAPPI standard method in the Valley laboratory beater, beating at a fairly rapid rate. The following mixtures were made: 100% hard pulp, 75% hard plus 25% soft pulp, 50% hard plus 50% soft pulp, 25% hard plus 75% soft pulp, and 100% soft pulp.

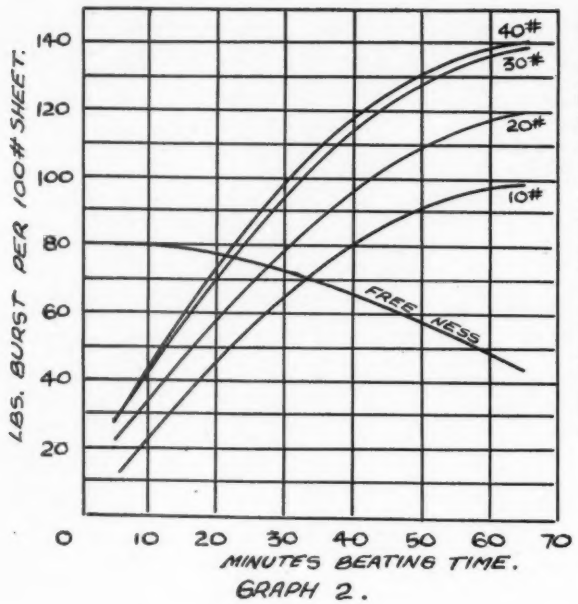
Under these conditions, the bursting strength developed in the high freeness ranges ran according to the percentage of each pulp present. In other words, at high freeness range the strength developed by a mixture of 50% of the high pulp and 50% of the low pulp, struck a strength very close to the actual arithmetical average of the two pulps individual strengths at that point.

As beating progressed, however, this relation cased to exist. Once real hydration began, in each percentage case the strength favored the higher bleachability or more rapidly hydrating pulp. This increasing ratio continued until at conditions of maximum mullen, a mixture of 75% of the higher pulp and 25% of the lower almost approximated the strength of the higher pulp in the 100% condition. The 50% mixture also showed a value considerably higher than an average as did the 25% mixture. See Graph 4.

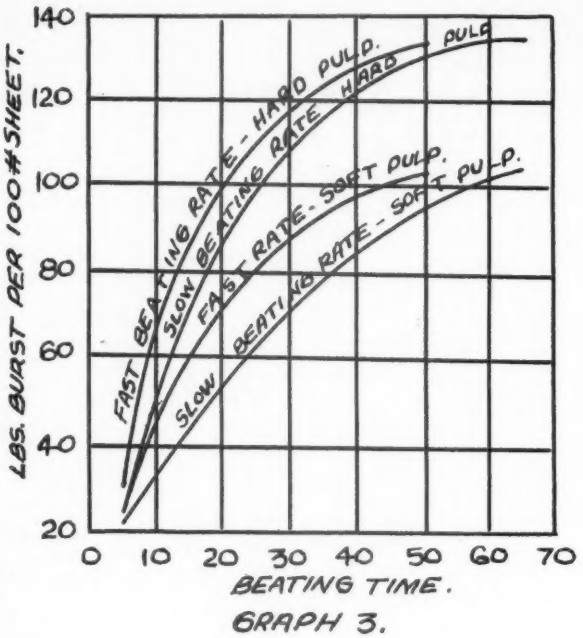
PULP	FREENESS	HOT BASIS WT.	CONDITIONED BASIS WT.	HOT BURST	CONDITIONED BURST	RATIO DIFFERENCE
100% HARD UNBLEACHED SULPHITE. TEST 1.	800	41.7	44.3	32.1	27.2	118.0
	735	41.5	44.3	80.2	83.0	96.7
	570	39.0	41.7	100.0	114.0	87.8
	381	38.4	41.3	105.2	126.0	83.4
100% HARD UNBLEACHED SULPHITE. TEST 2.	800	40.4	43.0	36.0	31.2	116.2
	736	40.8	43.6	78.0	79.2	98.3
	581	39.1	41.7	94.0	109.5	86.0
	412	40.0	42.8	106.0	132.0	80.3
100% SOFT UNBLEACHED SULPHITE. TEST 1.	760	38.2	40.5	26.5	23.5	113.0
	750	39.5	42.0	62.0	58.0	107.0
	667	37.8	40.6	89.5	87.0	103.0
	492	38.2	41.0	99.0	107.5	92.8
	280	36.5	39.0	97.0	114.0	85.0
100% SOFT UNBLEACHED SULPHITE. TEST 2.	800	39.8	42.0	25.6	21.0	122.0
	750	40.2	41.7	58.0	55.0	106.0
	660	38.8	41.3	83.2	83.0	100.2
	517	38.4	40.5	100.0	106.0	94.5
	349	37.2	39.8	94.0	111.0	84.8

ALL MULLEN FIGURES INDICATED ARE AVERAGE OF 10 TESTS.

CHART 1.



GRAPH 2.



GRAPH 3.

Tensile

● The tensile strength, under conditions of various percentages of the stronger pulp mixed with the weaker before treatment, shows a slightly different characteristic. The strength of the mixture remains an average of the constituent pulp strengths at various freeness ranges until a very low range is reached.

At this point, which is considerably later than the same point on the mullen curve, the tensile exhibits the same characteristics as noted in the case of the mullen. For example, a 50% mixture of the two pulps exhibits a higher strength than an average of the two.

Tear

● The initial tests of the two pulps showed that the tear followed usual characteristics and is higher in the case of the softer pulp than in the case of the harder pulp.

In the mixtures made as in the case of the mullen and tensile tests, the high freeness range tear is lower or in other words more closely approximates the strength of the hard pulp. As freeness lowers, this relation gradually varies until at low freeness and conditions of maximum mullen, the tear test is higher in proportion and favors the softer pulp.

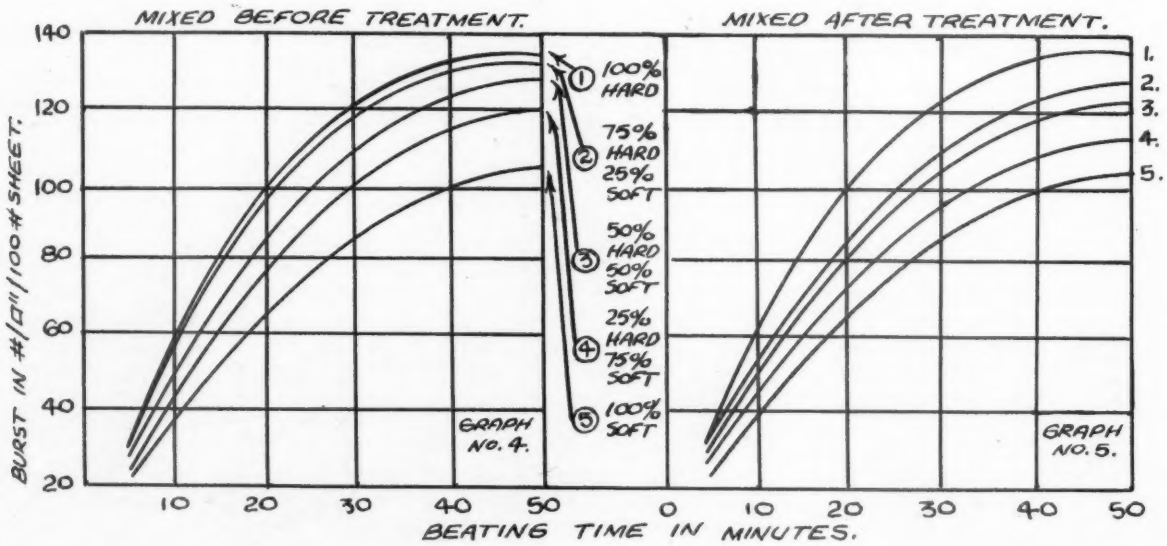
Individual Treatment of Pulp With Blending Before Formation of Sheet

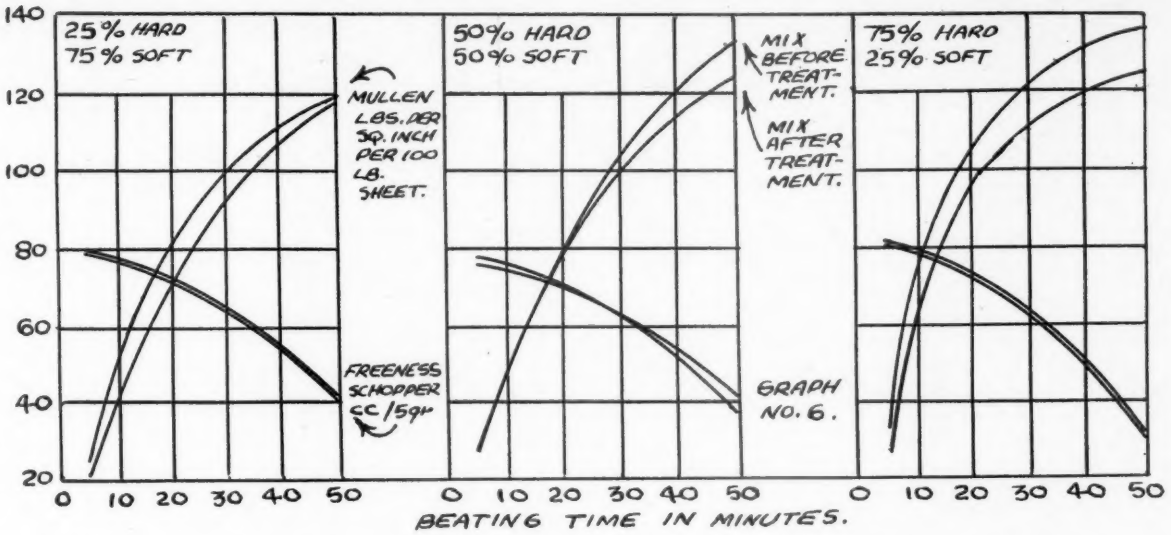
● Indentically the same pulp was used for this analysis as was used in the case of treatment after mixing. Samples were taken under conditions of individual treatment of each pulp throughout its range and mixed in the same percentages before sheet formation.

Mullen

● Under conditions of blending after treatment a totally different effect is obtained than under conditions of blending before treatment.

In this case the mullen strength, tensile strength, and tearing strength





more closely approximate the arithmetical average of the individual strengths of the pulps in the mixture. See Graph 5.

Freeness

● The freeness determinations for this investigation were run on the Williams Precision Tester in terms of seconds drainage. This was in turn corrected to Schopper Riegler cc's. for a five-gram sample.

Although a five-gram sample is not standard procedure, certain operating conditions have made it advisable for correlation in our particular mill case.

The freeness point of importance in relation to this work is that point at which the freeness curve exhibits its steepest rate. Regardless of type of freeness test this point is clearly indicated by all methods and may be correlated to the method used here.

In the case of the furnish treated after mixing the freeness drop coincided, within experimental limits, with the freeness drop of the blended pulp. Although freeness cannot be considered as an exact measure of treatment, this relation would seem to indicate that the mechanical action on, or physical state of, the fibers was identical in both cases. See Graph 6.

This apparently being true, then the increase in strength that may be obtained by treatment after blending rather than blending after treatment must be due in this case, not to a physical state of the fiber but a chemical state.

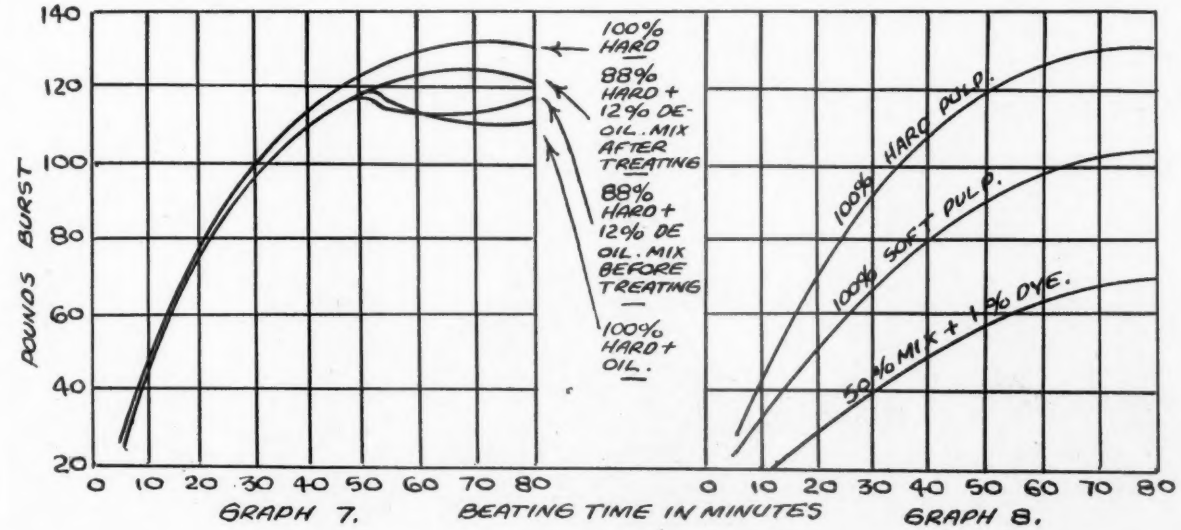
In the case of a pulp blended before work is done on it, the greater the treatment the more apparent this gain in strength over and above a mean average as evidenced in the case of blending after treatment. See Graph 6.

Further Indications

● Although this paper intends to deal primarily with the foregoing mixtures of unbleached sulphite grades, some work was done with: One, the addition of de-inked and de-oiled stock, and; Two, with the effect of high dye concentration. This further bears out the chemical bond factor in expected strength from pulp mixtures by showing the relation when such a bond is inhibited.

Presence of Oil or Oil-Base Inks

● Identical stock which had been printed and oiled and existed as broke was de-oiled by the caustic soda-soda ash method. This was mixed with the high strength and high bleachability pulp in the amount of 12%. The mixture was treated and handsheets formed as in the former case.



At the point where the mixture of the hard pulp and the softer pulp began to show increased strength in favor of the harder pulp in the foregoing experiment, the de-oiled stock mixture showed a marked falling off of strength or flattening of the mullen curve.

This de-oiled stock was then treated individually and blended before sheet formation. The decrease in mullen strength was not as marked but more closely followed an arithmetical mean of strength differential.

Free oil was added to the 100% hard stock and treated as before. This stock showed a very marked falling off at the point where in its pure state the hard pulp began to develop its highest strength. This would seem to indicate that oil present in even small amounts will inhibit strength development of a pulp in its lower freeness ranges. See Graph 7.

High Dye Content

● The hard and the soft pulp were mixed in equal percentages and very high dye concentration of 1% by weight added. The dye used was Benzo Green and Fastusol Yellow. An abnormally high concentration was used in order to multiply the effect.

This was then treated after mixture and an extremely low burst curve was noted. All points were considerably lower than the lower pulp grade in the mixture. See Graph 8.

Conclusion

● Some of the information on the addition of oil and dye to stock mixtures might at first thought seem irrelevant to the main investigation of the effect of mixed pulp furnishes on sheet properties, but in reality these facts aid in bearing out the conclusion to be made.

A mixture of two pulps, in the category of middle to prime grades of sulphite, is apparently capable of arriving at a higher strength when beaten together than by beating them individually.

This is true, however, only at that point in treatment where the freeness has been lowered beyond a certain range into which category such grades as facial tissue and toweling would not come. As the freeness is increasingly lowered towards the glassine stage, the increased strength that may be obtained becomes greater. This same effect would also be correspondingly true of a mixture of more than two pulps.

The increase in strength is apparently due to the fact that greater chemical bonding is obtained under these conditions.

Fiber length and physical condition remaining relatively constant under conditions of treatment after mixing and mixing after treatment, any gain in strength of one pulp over another favors the harder pulp. The term hard is ambiguous but by hard in this paper is meant higher bleachability and a more rapidly hydrating pulp.

The more rapidly hydrating pulp, under conditions of beating after mixing is enabled to realse more bonding substance in proportion than the lower and consequently in mixtures may result in a higher available mullen and tensile, and a lower tear, than would be obtained in the case of mixture after treating where the maximum must of necessity approach an arithmetical mean of the strengths developed individually.

If any substance such as oil or high dye concentration is present in the mixture, it may act as an inhibiting agent to the formation or release of the chemical bond and this advantage is lost.

In mixtures of domestic grades of unbleached sulphite where special reactions such as fillings, etc., are not necessary, but a certain strength is desired and a mixture of pulps is necessary, the following guide can be used.

1. In paper grades manufactured at high freeness values and exhibiting characteristics of extreme softness, low mullen, and high tear, no advantage can be gained in the case of standard sulphite mixtures treated after mixing. This effect can better be gained by individual treatment followed by blending.

2. In paper grades manufactured at freeness values ranging from medium to low, an advantage can be gained over and above those indicated by a mean of constituent pulp values, by treatment after mixing.

3. The strength increase that may be obtained by mixing before treatment is proportional to the percentage of higher bleachability pulp in the mixture.

Forde Called to Duty With the Army

● C. W. Forde, Jr., superintendent of the roofing factory, Pioneer Division, The Flintkote Company, Los Angeles, a captain in the reserve, was recently called to active duty with the Ordinance Department at Fort Lewis, Washington.

Other Pioneer-Flintkote men who have lately gone into active service include Vernon Brown of the board mill finishing room; and, Richard Egkan, board mill beater room.

Interpreting P-22 On Inventories

● "There has been considerable confusion concerning the interpretation of Order P-22 as it applies to inventories," E. W. Tinker, secretary of the American Paper & Pulp Association, advises pulp and paper mills. "Some mills have been under the impression that the order does not apply to materials of items not on the critical list. This has also been the impression of some suppliers.

"In answer to an inquiry on this subject by one of the paper mills, OPM states as follows:

" 'The advice given to you by your suppliers is incorrect as the provisions of Preference Rating Order P-22 amended, as it pertains to your inventory, does not designate that materials which are not on the Critical List shall not be included in your inventory. If your inventory is in excess of the inventory you had at the close of business at the end of your fiscal year, you are obliged to reduce this inventory to the minimum before you are able to accept delivery.' "

It is, therefore, quite specific that this Order applies to inventories of all general classes of items, regardless of whether they are on the Critical List. Another interpretation might be mentioned. On November 5th the director ruled that:

" 'The restriction imposed by 958.1 (P-22) upon producers (paper mills included) are not applicable to any person who has not applied the preference ratings assigned by the Preference Rating Order (P-22). As soon as any person applies the preference rating assigned by that Order (P-22), however, he becomes subject to all the terms and conditions of the Order.' "

"This will not help very many since most mills have, no doubt, used the A-10 rating for certain items in their warehouse which makes them subject to the Order.

Pulp Stocks Drop 20,600 Tons In September

● The American Paper & Pulp Association reports that the total stocks of wood pulp of paper grades of purchased sulphite and sulphate pulps dropped 20,600 tons in September, from 476,300 tons at the end of August to 455,700 tons at the close of September. This data is from reports to the AP&PA, the National Paperboard Association and the United States Pulp Producers Association.

The September shrinkage was larger than the drop in August, 18,500 tons and much greater than the decline in July, 5,800 tons. The largest monthly drop during 1941 so far occurred in January when stocks declined 34,900 tons.

On January 1st, 1941, the total stocks of these pulps amounted to 638,100 tons, the drop during the first ten months totaling 182,400 tons.

During September the total supply of wood pulp of the above grades amounted to 186,375 tons and apparent consumption was 206,975 tons, leaving a total of 20,600 tons to be withdrawn from stocks.

Weisheit Married October 3rd

● John Weisheit, beater room engineer, Pioneer Division, The Flintkote Company, Los Angeles, was married on October 3rd to Eileen Brown.

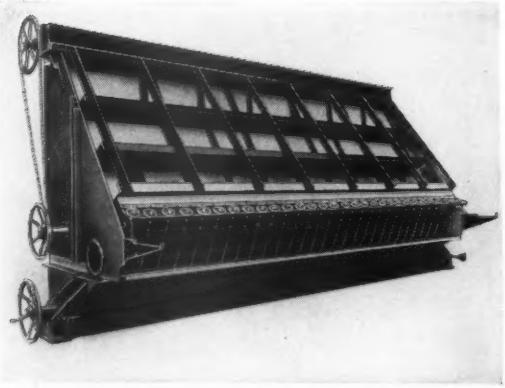
INCREASES PRODUCTION

PRODUCTION and uniformity of product are among the major problems confronting most paper mills today. The capacity of any paper machine is only as great as the capacity and efficiency of the slice on the paper machine. Therefore, the Bagley and Sewall Engineering Department made an extensive study of this slice situation. The *new* Bagley and Sewall Slice is an outstanding result of this survey.

The simplicity and ease of adjusting the flow of stock to the wire by means of this *new* slice provides a very desirable assistance in forming a level and well laid sheet of paper.

The whole design of this slice lends itself to quick, accurate and dependable adjustment, without cumbersome or complicated equipment.

In every instance where one of these Bagley and Sewall Slices has been installed, not only has production been greatly increased, but a more uniform and level sheet has been produced.



An illustrative and descriptive bulletin is available.

THE BAGLEY & SEWALL CO.

WATERTOWN, NEW YORK

BUILDERS OF FINE PAPER MACHINES AND PAPER MAKING EQUIPMENT

Dexter Drafted for OPM Purchasing Division

● Oakley W. Dexter, head of the Crown Zellerbach Corporation's purchasing department, with headquarters in San Francisco, has been named assistant director of purchases of the Office of Production Management, it was announced at Washington, D. C., November 25th by Douglas C. MacKeachie, director of purchases of the OPM.

Mr. Dexter will be chief of the safety and technical equipment branch, created by splitting up the health supplies and fire equipment branch. The branch headed by Mr. Dexter will have under its jurisdiction all motorized fire equipment, fire extinguishers, fire hose and fire hose couplings, sprinkler systems and a variety of safety and technical equipment.

Crown Zellerbach Corporation is cooperating with the government by giving Mr. Dexter a leave of absence for such time as he is needed and will pay his salary all of the time he is with the OPM. He is joining the ranks of the "dollar-a-year" men to contribute his purchasing experience to the defense program.

He has been with Crown Zellerbach and its predecessor corporation, Crown Willamette Paper Company for more than 26 years and has been head of the purchasing department since 1932. On March 22, 1940, more than 250 employees of the headquarters office in San Francisco tendered Mr. Dexter a surprise party upon the occasion of the completion of his 25th year of service.

Canadian Domestic Newsprint Price to Remain Unchanged

● Although Canadian newsprint mills may increase their export prices next year, Canada's Wartime Prices and Control Board, which is establishing ceilings on all commodities to halt the spread of inflation, will not permit the price of newsprint in the domestic market to rise.

Donald Gordon, head of the Wartime Prices and Control Board, commented on the announcement of International Paper Company that for the period April 1 to June 30 the price of newsprint will be increased $3 a ton to $52.

"I assume," said Mr. Gordon, "that the statement refers to the export price on which there is no restriction."

West Linn Grinding At Top Speed

● The Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, West Linn, Oregon, is now into its winter grinding program, since the Willamette River has been swollen by the fall rains, according to C. E. Bruner, resident manager.

Middlebrook Offered Mayor's Job

● Paul Middlebrook, resident manager, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Lebanon, Oregon, was chosen by the city council for the position of Mayor of Lebanon, but Middlebrook was unable to accept the office. This was because the press of business and other previous commitments do not leave him the time necessary for the duties of the position, he said.

The executive position of the city was left vacant by the resignation of Walter Scott.

Robert Nivison, Jr. to Represent "IMPCO" on Pacific Coast

● Robert Nivison, Jr., arrived in Portland during November to represent the Improved Paper Machinery Corporation of Nashua, N. H., on the Pacific Coast. Mr. Nivison succeeds Kenneth B. Hall, "Impco" representative for a number of years, who has been elected president and general manager of the Hesse-Ersted Iron Works of Portland.

The announcement that Mr. Nivison would henceforth sell and service "Impco" pulp and paper mill equipment on the Pacific Coast was made by Walter L. Barker, president of the company.

Mr. Nivison has been with "Impco" five years. The first six months of that time was devoted to work on the assembly floor of the plant at Nashua. Then followed two years in the South installing and starting up "Impco" equipment. Some time was also spent in the Eastern territory on sales and service work. Two years ago Mr. Nivison was transferred to the Midwestern territory. From headquarters in Appleton, Wisconsin, he concentrated upon sales and development of new equipment covering Michigan, Illinois, Wisconsin and Minnesota.

Before becoming associated with "Impco" Mr. Nivison attended the University of Maine, taking the pulp and paper technology course. Summers he spent timber cruising for a large paper manufacturer. Upon graduation he worked for a time for the Waterville Iron Works in Waterville, Maine, as a machinist and foundryman's helper. From Waterville he joined "Impco."

Born in Gardiner, Maine, Mr. Nivison is a member of a Scotch family who have been papermakers for three generations, starting at Guardbridge, Scotland. He is married and has a son and a daughter. His temporary headquarters are at the Multnomah Hotel in Portland.

ROBERT NIVISON, Jr., Pacific Coast Representative for "Impco"

Soundview Averages 550 Tons Per Day in October

● Notwithstanding new records in production and sales in October, earnings of Soundview Pulp Co. were only slightly higher than in the preceding month and well below the average for 1941. The company reports October net profit of $130,967 after depreciation, depletion, normal income tax and estimated excess profits tax, equal, after dividend requirements on the preferred stock, to about 24 cents a share on 488,250 shares of common stock. This compares with net profit of $130,653 for the preceding month, also equal to 24 cents a share, and with $120,575 or 22 cents in the like month of 1940.

Sales totaled 17,233 tons, a new peak, while production paralleled the increase, totaling 17,034 tons. In the preceding month the company sold 15,342 tons and produced 15,593[e] tons. For October, a year ago, sales were 12,947 tons and production 15,368 tons.

Net profit for the first ten months of this year aggregates $1,521,981 or $2.89 a share on the common, as against $1,791,236 or $3.45 in the like period of 1940. Pulp sold totaled 158,022 tons, compared with 152,718 in the corresponding 1940 period. Production amounted to 156,302 tons as against 147,599 tons.

As the result of record sales, the company's inventory position was only 925 tons at month-end, as against 8,063 tons on hand October 31, 1940.

Paper Shortage Not Expected To Affect Canada Severely

● Shortage of paper in Canada will not be as great as that in the United States during the coming year, in the opinion of John H. Young, manager of Pacific Mills, Ltd., operating at Ocean Falls and Vancouver, B. C.

The mills are being forced to change their manufacturing technique to some extent due to curtailment of chlorine and other materials, but the difference in quality of paper will hardly be noticeable to the consumer and Mr. Young does not believe that it will be necessary to eliminate production of any basic lines unless conditions now unforseen materialize.

New Plastic Tubing Replacing Copper in Many Applications

SARAN, The Dow Chemical Company's tough new plastic is not on priority—Tubing available at present in sizes from ⅛ to ⅜-inch outside diameter.

WITH all copper under strict allocation through a ruling of the Office of Price Administration and Civilian Supply, The Dow Chemical Company recently announced that a flexible, semi-transparent tubing of thermoplastic Saran is available to industry as an alternative for copper and other metal tubings.

Although the Priorities Division of the OPM has amended the copper conservation order No. M-9-c by inserting paragraph 8 under General Exceptions permitting the use of copper or copper base alloys for repair or replacement purposes in plants employing chemical processes where the existing installation is copper or copper base alloy and where and to the extent that chemical action makes the use of any other material impractical, the industry is still faced with the problem of obtaining copper tubing. It is one of the scarcest of all products made of copper due to the heavy demands of defense equipment.

Developed through years of research, Dow's tough, chemically resistant Saran tubing may be used for many applications in the pulp and paper industry previously demanding copper except where high temperatures and very high pressures are encountered. Also, Saran tubing has been tested and proved suitable to replace such strategic materials as nickel, stainless steel, copper and ceramics in several fields where its unusual properties are advantageous.

Saran is characterized by unusual toughness and resistance to moisture, brines, solvents, acids and alkalies. Another feature of this plastic material is that it may be used for short periods of time at temperatures of two hundred and fifty degrees to two hundred and seventy-five degrees Fahrenheit, although its strength and resistance are somewhat reduced at these elevated temperatures.

Available in sizes one-eighth inch to three-eights inch outside diameter with wall thicknesses varying from .030 inches to .062 inches, this tubing may be joined by Parker Standard Tube Couplings and S. A. E. or other flare type fittings. The Mueller Brass Company of Port Huron, Michigan, has developed fittings for Saran tubing which permit the construction of a tubing system in which contact between such fittings and the material is entirely eliminated.

Flaring for Parker or S. A. E. standard couplings may, in most instances be accomplished with standard flaring equipment at room temperature. In some cases, particu-

Table I

Properties of Unoriented Saran Tubing

(All properties listed are averages of production materials and are not to be construed as specifications)

I. Mechanical.

A. Bursting strength (See Table II)
B. Ultimate elongation, per cent—10-40
C. Impact, foot pounds energy to break ½ x ½" bar—1-4
D. Hardness (Rockwell Superficial 15Y)—71
E. Hardness (Rockwell M)—38

II. Thermal Properties.

A. Thermal conductivity—0.00022 cal/sec/cm^2/°C/cm.
B. Specific heat—0.32 cal/°C/gm.
C. Resistance to heat (continuous)—satisfactory up to 150° F.
D. Heat distortion temp., °F.—150-200
E. Tendency to cold flow—slight
F. Coefficient of thermal expansion—15.8 x 10^{-5}/°C.
G. Softening point, °F.—310-325.

III. Electrical Properties.

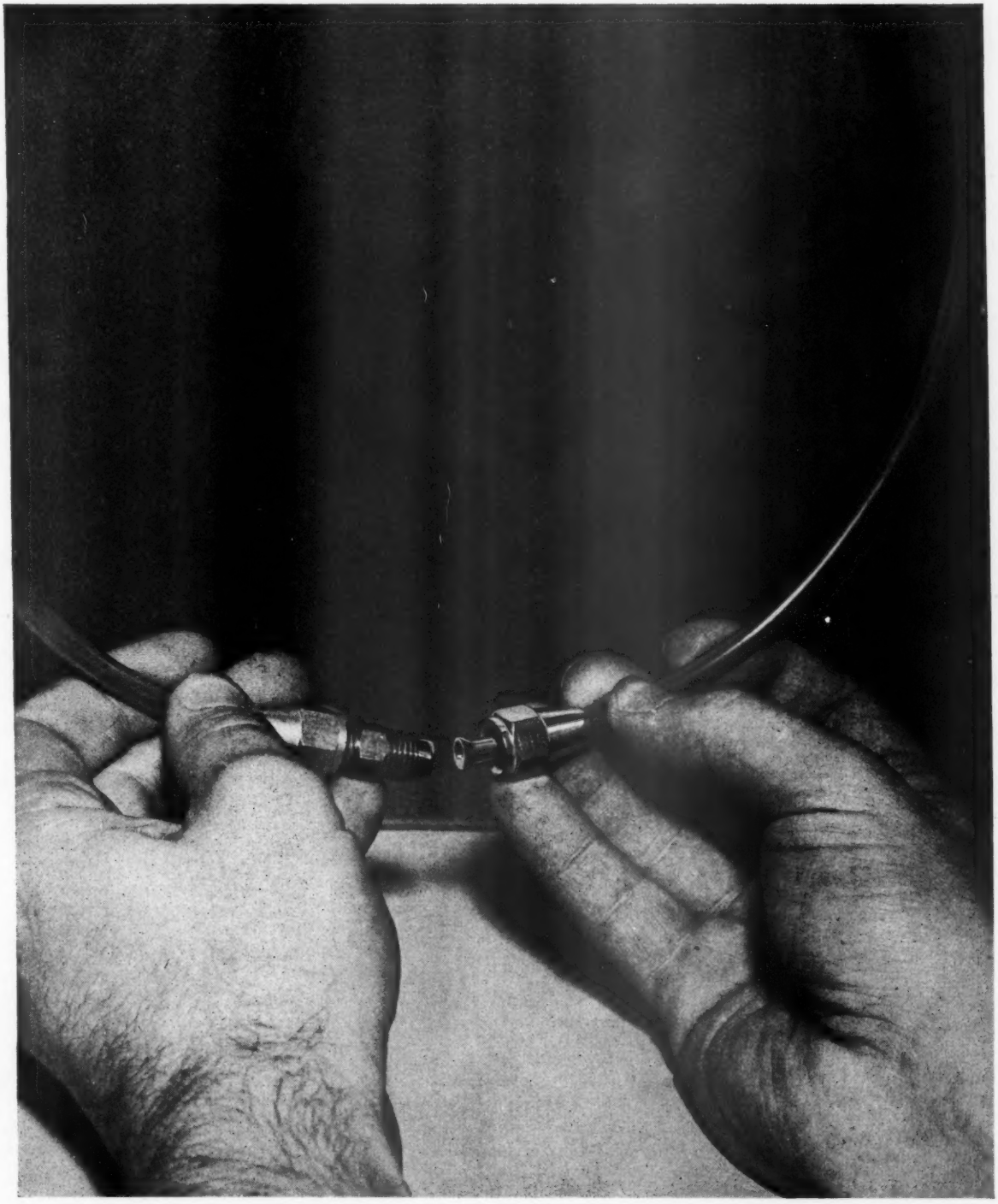
A. Volume resistivity, ohm/cm. (50% Rel. Humidity and 25° C.)
10^{14} to 10^{16}
B. Breakdown voltage 60 cycles
Volts/mil—instantaneous
3,000 volts/mil at 1 mil
1,500 volts/mil at 20 mils
500 volts/mil at 125 mils
C. Dielectric constant
60 cycles—3.0-5.0
10^3 cycles—3.0-5.0
10^6 cycles—2.5-5.0
D. Power factor
60 cycles—.03-.08
10^3 cycles—.03-.15
10^6 cycles—.03-.05

IV. Optical Properties.

A. Refractive Index nD = 1.61
B. Clarity—translucent to opaque
C. Color possibilities—extensive

V. General Properties.

A. Specific gravity—1.68-1.75
B. Specific volume—15.8-16.6 cubic in. per lb.
C. Water absorption—24 hours at 25° C.—0.00%
Water absorption—168 hours at 25° C.—0.5%
D. Water permeability—negligible
E. Corrosion resistance—excellent
F. Effect on metal contacts—none
G. Machining qualities—good
H. Burning rate—self-extinguishing



SARAN plastic tubing is replacing scarce copper tubing for many uses in the pulp and paper industry. Tough but flexible, Saran tubing can be bent to sharp angles without flattening of the walls.

It may be coupled with the standard tube couplings such as the S.A.E., shown in the photograph, the Parker, or, if contact between the fluid and the coupling is undesirable, a Mueller coupling may be used. Bursting strength is high. A section withstood 1500 pounds per square inch without rupturing. Fatigue resistance is extremely great. Flexed 1750 times per minute through an angle of 15 degrees, Saran tubing was still good after 2,500,000 cycles while copper tubing failed after about 500 cycles.

Resistant to moisture, brines, solvents, acids and alkalies, Saran tubing is also resistant to heat up to 275 degrees F. Saran is a vinylidine chloride polymer manufactured by The Dow Chemical Company, Midland, Michigan.

larly when flaring is attempted in the cold (below 40°F. or 50°F.), it is advantageous to dip the end of the tube to be flared in hot water and to have the flaring tools heated to normal room temperature. Any necessary trimming can be done with a knife, scissors, or file.

Saran, a thermoplastic has excellent resistance to water and brines, straight chain alcohols, ethers, ether-alcohols, alcohol-esters, and aliphatic hydrocarbons. Solvents such as ethers, ketones, aromatic hydrocarbons, halogenated aliphatic and aromatic hydrocarbons, and nitroparaffins normally have little effect on Saran, although in some cases a softening action with minor changes in physical properties is encountered. The cyclic oxygen bearing organic solvents such as dioxane and cyclohexanone may soften and swell the plastic on prolonged contact. At room temperature, it is substantially resistant to both concentrated and dilute alkalies and to all mineral and organic acids, with the exception of concentrated sulphuric acid and strong ammonium hydroxide and caustic, which may discolor the surface but produce only a negligible change in mechanical properties. In general, the chemical resistance of the plastic decreases with increasing temperatures, particularly above 150°F.

Physical Properties of Saran

● Certain of the physical properties of unoriented Saran are listed in Table I.

The mechanical properties of Saran tubing are further illustrated by the following tests that were run on $\frac{3}{16}$" O.D. tube having a .062" wall. Tubing joined with "B" Parker Standard Tube Couplings withstood a pressure of 1500 pounds per square inch without rupturing or leaking. In a fatigue test, tubing was flexed through an angle of 15°, 1750 times per minute, for 2,500,000 cycles without failure. In comparison, standard ¼" copper tubing failed after about 500 cycles in the same test. This indicates that Saran tubing would be superior to copper tubing for those applications where excessive vibration is encountered. A Saran tube system was completely filled with water, sealed tightly, and subjected to 10 alternate one-hour cycles at —15° F. and +115° F. At the end of this time there was no rupture or other apparent change in the tubing.

Typical bursting strengths for Saran tubing are listed in Table II.

Saran tubing retains its mechanical properties when subjected to elevated temperatures for short periods of time. For example, ¼" O.D. tubing with .035" wall showed no tendency to collapse within 3 hours at 300° F. and 1 mm. absolute pressure. Saran tubing of ¼" O.D. and .035" wall did not bulge or rupture when heated to 212° F. and subjected to 200 pounds per square inch air pressure for 13 hours.

Suggested Uses

● A few of the suggested uses for this tubing include the following:

1. Oil lines for motors having central oil systems.
2. Gasoline lines for automobiles.
3. Tubing for recording devices and gauges.
4. Siphon tubes for acids, alkalies and organic materials.
5. Lead-in pipes for corrosive fluids.
6. Atomizer tubes.
7. Refrigerant transfer.
8. Electrical insulation.
9. Sight tubes.
10. Humidifier supply lines.
11. Air and water lines.

The Dow Chemical Company will welcome questions on specific properties of Saran tubing or requests for samples to be used under operating conditions. Inquiries should be addressed to Great Western Division, The Dow Chemical Company, Textile Tower, Seattle; 310 Sansome Street, San Francisco; 4151 Bandini Blvd., Los Angeles; or The Dow Chemical Company, Plastics Sales Division, Midland Michigan.

Table II

Outside Diameter	Wall Thickness	Bursting Pressure	Working Pressure (Safety factor=5)
¼"	.060"	1840 lbs./in²	370 lbs./in²
¼"	.045"	1260 lbs./in²	250 lbs./in²
¼"	.030"	630 lbs./in²	130 ibs./in²
$\frac{3}{16}$"	.033"	1150 lbs./in²	230 lbs./in²
$\frac{5}{32}$"	.031"	1290 lbs./in²	260 lbs./in²
⅛"	.030"	1795 lbs./in²	340 lbs./in²

Port Angeles Men Return From Military Service

● Two more men returned to their jobs in Port Angeles pulp and paper mills during November after serving more than a year in the U. S. Army. They were Sergeant Sidney Kidd, of the Fibreboard Products force, and Corporal Arthur Tobias, employed in the machine room of the Crown Zellerbach Corporation plant. Both were attached to Battery A, 248th Coast Artillery, at Fort Worden.

Otto Hartwig Earns First Dollar—as "Dollar a Year Man"

● Otto R. Hartwig recently earned his first dollar and has since been proudly displaying the check to friends.

This may sound peculiar, as everyone who knows Mr. Hartwig—general safety supervisor and social security director for Rayonier Incorporated and Crown Zellerbach Corporation—also knows he has been working a good many years and has received several dollars in that time.

But this was different. It was his first dollar payment as a dollar-a-year man in U. S. Government service.

Mr. Hartwig received the "salary" for serving in the field of conservation of man power. He is one of a long list of individuals connected with the Pacific Coast pulp and paper industry now devoting a major and growing portion of their time to national emergency work as a patriotic duty.

Nelson Reelected Head of Paperboard Association

● Charles E. Nelson, president of the Mac Sim Bar Paper Company, Otsego, Michigan, was reelected president of the National Paperboard Association at the annual meeting in New York last month.

George E. Dykes, president of Robert Gair, Inc., was reelected vice president; Frederick G. Becker, executive manager; and, H. S. Adler, secretary-treasurer.

Mr. Adler reported that paperboard production so far in 1941 had increased 23.7 per cent over the same period in 1940.

Mouat Wins $200 Defense Bond

● Bill Mouat, wrapping salesman for Blake, Moffitt & Towne, San Francisco, had a lucky November 7th, for it was on this date that winners of the Tested Papers of America National Lamp Contest were announced. Bill received a wire from Frank Vaughan of Tested Papers congratulating him on his good fortune. The prize—a $200.00 Defense Savings Bond.

Pioneer Girl Bowlers In First Place

● The girls' bowling team of the Pioneer Division, The Flintkote Company, Los Angeles, is knocking over pins at a great rate. As of October 13th they were in first place in the Southeast Industrial Athletic Association, with 15 games won and 5 lost.

Members include, D. Lockner, G. Weidenbaker, E. Thomas, E. Mount, E. Watts, R. Hopkins and E. Morent.

Chemical Studies of Sulfite Waste Liquor Pollution of Sea Water

Part I—

by H. K. BENSON, K. A. KOBE and R. H. SCOTT*

UNDER a similar title, the spread of sulfite waste liquor (S.W.L.) in Oakland Bay was discussed[1] and the methods for its detection were described. These consisted of pH, buffer effect (in mM H+/liter), chloride ion, dissolved oxygen, biochemical oxygen demand, color, and oxygen consumed. Through the control of the mill waste liquor discharge, and by means of definite flows of waste liquor in troughs over long periods of time, it was possible to note a marked effect on the constants of unpolluted sea water when the concentration of liquor was greater than 100 p.p.m. The prime difficulty in such tests was the lack of specific detection. Only by ruling out other polluting substances and by use of a standard or reference sample of unquestioned purity could such effects be ascribed to the waste liquor itself.

Investigators in this field of pollution have utilized various properties of lignin, which comprises approximately fifty per cent of the non-aqueous portion of S.W.L., for testing it in water. If the polluted body is fresh water, the phloroglucinol test[2] can be applied with success. However, due to the necessity of evaporating the samples to dryness, the salt content of sea water intereferes with the phloroglucinol test. One of the first steps in this study, therefore, was the development of a method with a sensitivity greater than 100 p.p.m. that was specific for lignin in sulfite waste liquor.

Colorimetric Test for Sulfite Waste Liquor

● On the assumption that the soluble lignin contains an aromatic structure of phenolic nature, a reaction with nirtous acid to form a color compound might be expected. Under the same conditions as the official test for nitrite in water[3], such a test was developed by Pearl and Benson[4]. When sea water containing sulfite waste liquor is acidified and nitrous acid is added, an amber color is developed. Subsequent addition of ammonia intensifies the color, which can be read in field test to a sensitivity of ten p.p.m., or under laboratory conditions to one p.p.m. Normal sea water, even though it carries sewage and trade wastes (of non-aromatic nature), will not develop any color when treated with an acidified nitrite solution.

This method has been used in conjunction with other tests such as pH, dissolved oxygen, oxygen consumed, salinity, and buffer effects for the detection of pollution by sulfite waste liquor. The test has also been introduced into mill operation to determine the efficiency of pulp washing. In Table I, giving blowpit washing data, the total solids, volatile matter and ash were determined by evaporation and ignition; pH by the Beckman glass electrode; per cent SO_2 by iodine titration; acidity is expressed as cc. of normal NaOH per liter of blowpit liquor; and organic number is determined by the method of Triplett[5]. The close agreement of the colorimetric method with the established methods for determining the extent and efficiency of pulp washing is given in Fig. 1.

*Department of Chemistry and Chemical Engineering, University of Washington, Seattle, Washington.

Table I
Blowpit Washing Cycle*

Time (min.)	Total Solids (p.p.m.)	Ash (p.p.m.)	Volatile Solids (p.p.m.)	pH	Colorimetric S.W.I. (p.p.m.)	%SO_2	Acidity NaOH (c.c./1)	Org. No.
1	66,200	7,900	59,300	2.16	700,000	0.24	63	176
15	91,000	10,200	80,800	2.08	960,000	0.31	87	235
30	88,000	10,700	78,100	2.13	900,000	0.27	86	229
45	80,900	9,100	71,800	2.20	760,000	0.26	60	205
60	57,200	7,300	49,000	2.37	380,000	0.19	50	149
75	31,600	4,300	27,300	2.68	250,000	0.09	47	66
90	24,500	2,800	21,700	2.87	50,000	0.051	11	42
105	11,000	1,900	9,100	2.95	35,000	0.035	7.9	26
120	7,700	1,900	5,800	3.02	24,000	0.022	6.6	18

*Data by Eric Ericsson, chief chemist, Puget Sound Pulp and Timber Co.

Dissolved Oxygen Values in Bellingham and Fidalgo Bays and Other Areas of Puget Sound

● Since sanitary authorities are mainly concerned with the maintenance of natural aquatic life in water bodies, chief reliance is placed by them upon a proper content of dissolved oxygen in the water. The amount of oxygen essential for fish life varies with the age and the species of fish and other forms of aquatic life. Minimum values of two to five parts per million are given in the literature as applicable to certain fixed conditions. The Pollutions Commission of the State of Washington has set five parts per million as the minimum value for dissolved oxygen concentration[6].

The areas which are to be discussed in this paper, lie in the vicinities of pulp mills located at Bellingham and Anacortes. The San Juan Island area to the west of these bays is also under consideration.

In upper Bellingham Bay, dissolved oxygen studies were made by first obtaining samples close to the pulp mill sewer outlet, then sampling the water in ever-widening circles away from the mill until it was apparent that constant values were being obtained. From some typical data obtained in this preliminary study, it is possible to show to what extent the dissolved oxygen content of this region is diminished below the 5.00 p.p.m. minimum set by the State Pollutions Board. Fig. 2 illustrates a typical condition during the period of low water. The area affected (enclosed by the dotted line and the shore line) is shown to extend approximately two miles southward. During the period of high water, however, the effect of oxygen depletion is limited, typically, to the immediate vicinity of the pulp mill. (Fig. 3) It will be noticed the values given for these two figures were obtained from surface samples only. The question may arise as to why no reference is made to bottom samples or to some other depths. This is due to the fact that the mill effluent is lighter than

[1]Benson, H. K., **Ind. Eng. Chem.**, 24, 1302 (1932).

[2]Investigation of the pollution of the Fox and East Rivers and of Green Bay in the vicinity of the city of Green Bay by the Wisconsin State committee on water pollution and state board of health, etc., 1938-1939, general information, pages 27-28.

[3]Standard Methods for the Examination of Water and Sewage, American Public Health Association, 1936, page .....

[4]Pearl, I. A., and Benson, H. K., **Paper Trade J.**, 111, 35 (1940).

[5]Triplett, C. L., **Pac. Pulp and Paper Ind.**, 14, 18 (1940).

[6]Bulletin No. 2, Pollution Series, State Printer, Olympia, Washington, page 96, June (1940).

● Through the courtesy of the Puget Sound Pulp & Timber Company of Bellingham, Washington, the results of the company's scientific studies, carried on for a year and half in preparation for its successful defense against the suit for alleged damages instituted by the Pioneer Oyster Company (see pages 5 to 9, October, 1941, issue), are being made available for the benefit of the entire pulp industry.

The second part of this paper will appear in the January, 1942, number and will be followed in subsequent issues by additional data.

● It is stated by the authors that the Pearl-Benson colorimetric test for waste sulphite liquor, originally developed to determine the extent of pollution in sea water, has been introduced into mill operation to indicate the efficiency of pulp washing.

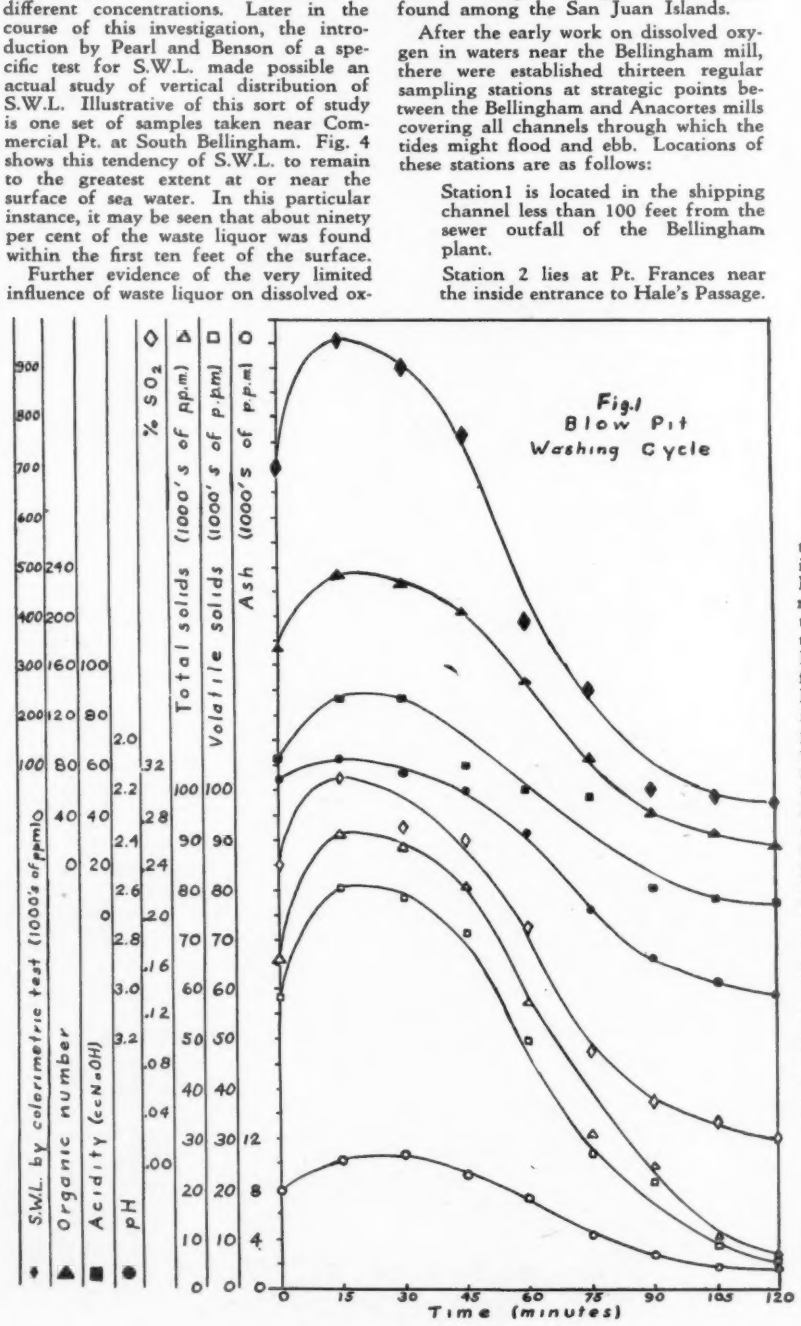
sea water. Analysis shows that blowpit liquor has a specific gravity of 1.006, while sea water specific gravities range from 1.0319 close to the mill outlet to 1.023 at greater distances from the mill. Thus it may be seen that the waste liquor would have a tendency to float on the heavier sea water until mixing takes place by agitation or by a natural diffusion which will always occur between solutions of different concentrations. Later in the course of this investigation, the introduction by Pearl and Benson of a specific test for S.W.L. made possible an actual study of vertical distribution of S.W.L. Illustrative of this sort of study is one set of samples taken near Commercial Pt. at South Bellingham. Fig. 4 shows this tendency of S.W.L. to remain to the greatest extent at or near the surface of sea water. In this particular instance, it may be seen that about ninety per cent of the waste liquor was found within the first ten feet of the surface.

Further evidence of the very limited influence of waste liquor on dissolved oxygen is shown clearly by comparison of values obtained near the pulp mills with other values found on the same dates (March 22, 23, 24, 1940) in the waters around the San Juan Islands many miles away. (Fig. 5) Samples as close as 2.2 miles to the Bellingham mill and as close as 1.3 and 1.7 miles to the Anacortes mill are shown to have dissolved oxygen values as high or higher than values found among the San Juan Islands.

After the early work on dissolved oxygen in waters near the Bellingham mill, there were established thirteen regular sampling stations at strategic points between the Bellingham and Anacortes mills covering all channels through which the tides might flood and ebb. Locations of these stations are as follows:

Station1 is located in the shipping channel less than 100 feet from the sewer outfall of the Bellingham plant.

Station 2 lies at Pt. Frances near the inside entrance to Hale's Passage.



Station 3 is at the south tip of Eliza I. where the tides flow to and from Bellingham Channel.

Station 4 is situated southeast of Vendovi I. about half way to Pt. William. Past this point must go any waters which might flow from Bellingham Bay into Padilla Bay.

Station 5 lies between two small islands to the east of Guemes I. Any possible flow from Anacortes Harbor into the upper part of Padilla Bay would be noticed at this point.

Station 6, just south of Hat I., covers any possible flow eastward to Padilla Bay.

Station 7 is in the entrance of Fidalgo Bay.

Station 8 is about four tenths of a mile from the Anacortes pulp mill sewer and lies in the path of waste flowing to Guemes Channel.

Station 9 is centered in Guemes Channel, the main entrance of water to the Fidalgo and Padilla Bay region.

Station 10, off the southwest tip of Samish I., also covers the entrance from Bellingham Bay to Padilla Bay.

Station 11 is on the north side of Samish I. adjacent to commercial oyster beds.

Stations 12 and 13 are located south and north of the Commercial Pt. bell buoy and lie in the course of waters flowing to and from the Bellingham mill.

The geographical locations of these thirteen stations are more clearly shown in the accompanying chart. (Fig. 6) Having established these positions, it is now possible to make one further observation on the dissolved oxygen values in the waters between the two pulp mills. Each of the above stations was sampled fifteen or sixteen times during the period Feb. 27, 1940, to June 6, 1940, which includes the seasons of the year when plankton activity is at a minimum in winter and when it approaches a maximum in summer. The range of dissolved oxygen values during this time is quite large due to the extensive generation of oxygen by photosynthesis. From the dissolved oxygen data for this fourteen-week period was selected the lowest value found for each of the thirteen stations. On a graph (Fig. 7), which depicts the two pulp mills as sixteen miles apart, are plotted the positions of the stations in miles from the mill which is more likely, from geographical consideration, to have an influence on the water at this station. When the minimum oxygen data were plotted against these distances, it is clearly shown that only a station within a very short radius of a pulp mill is materially affected at any time with respect to dissolved oxygen depletions.

Chemical Analyses of Water at Various Established Stations

● Chemical analyses were made of surface and bottom samples from the stations above described. In addition to dissolved oxygen, several other characteristics of the sea water were determined.

The pH was measured by the Beckman pH meter. Such data, in conjunction with the salinity, which was determined by silver nitrate titrations is useful in establishing and confirming the effect of an influx of fresh water or of a comparatively large amount of S.W.L. Records were kept of the temperatures of all samples, which enable computation of the per cent saturation of dissolved oxygen. Another test used was the oxygen consumed. This is somewhat comparable to biochemical oxygen demand, but is a more drastic measure of oxidizable organic matter. The method employed was the improved procedure of Benson and Hicks[7] for oxygen consumed in sea water. Finally, the nitrosolignin colorimetric determination was used to specifically detect the concentration of sulfite waste liquor. In order to determine the effects of tidal conditions, the sampling time of each station and the times of the low and high tides for each date were also enerted in the record.

From the log for February 27, 1940, to June 6, 1940, which contains the complete data for the thirteen stations, have been seletced four representative dates for each station, intended to show conditions on two of the dates as close as possible to the period of low slack water and on two dates as close to the period of high slack tide as possible. (Table II) Examination of this data will bring out any trends or tendencies of the characteristics of the sea water to change with the seasons. First, the temperature naturally has a tendency to rise as the season progresses from winter to summer. The only noticeable variations in pH occur at the stations influenced on the surface by the spring floods of rivers such as the Nooksack which empties into the northwest corner of Bellingham Bay. Abnormally low pH at Stations 2 and 3 is not attributable to the presence of large quantities of S.W.L. but to the influence of fresh water. This is fully substantiated by simultaneous occurence of salinities which are lower than the general average prevailing at the given station. The trend of dissolved oxygen is that of an increase in the warmer seasons, in which the photosynthesis of plankton causes a state of supersaturation of dissolved oxygen, especially in the surface waters. High dissolved oxygen values are also found in waters with lowered salinites. Due to the high concentration of bisulfites at Station 1, no dissolved oxygen determinations were made.

The saturation of dissolved oxygen varies, roughly, between 80 and 120 per cent in waters unaffected by pollution. As in the concentrations of dissolved oxygen, the percentage saturation is greatly influenced by the amount of plankton activity. The seasonal variations in the living organic matter in sea water are also indicated by the permanganate oxygen consumption, particularly at the stations where S.W.L. has never been detected. This test, however, will also show the presence of other oxidizable organic materials. When any appreciable amount of S.W.L. is present, i.e. from 30 to 50 parts per million and greater, a sharp increase is noted in the oxygen consumed values. Care must be taken, however, not to attribute all organic material (other than sea water organisms) to the presence of sulfite liquor, since seweage and other wastes are also oxidized when digested in permanganate. Since the nitrosolignin test is specific, there is of course no seasonal variation due to changes in characteristics of the water body.

The effect of sulfite waste liquor on the constants of an unpolluted sea water is of interest. The water selected for this study was obtained near the end of flood tide at Rosario Beach, a point opposite the eastern end of the Straits of Juan de Fuca. Aliquots of this sample were artificially polluted with waste liquor in concentrations from zero to 1000 parts per million. The effect of pH, dissolved oxygen content, and the permanganate oxygen consumed of Rosario Beach water is pictured in Fig. 8. If such graphs are plotted periodically in conjunction with the regular sampling of stations, they are usefuel in determining, by comparison with the actual S.W.L. values found at the stations, how much pollution may be ascribed to sources other than waste liquor.

[7]Benson, H. K., and Hicks, J. F. G., Ind. Eng. Chem., Aanal. Ed., 3, 30 (1931).

Finnish Superintendents Study American Mills

● Two Finnish production executives, Gunnar Kulvik of the Enso-Gutzeit Corporation; and, Hannes Jansson of the Sunila sulphate pulp mill, Sunila Company, arrived on the Pacific Coast early in December to spend several weeks visiting mills in the region.

Primarily interested in kraft pulp production, Mr. Jansson and Mr. Kulvik have been in the United States for nine months and have spent most of that time in the Southern states. Upon arriving in this country they planned to stay a year and a half as student fellows of the Walter Ahlstrom Foundation of Finland. Both men hold positions in their respective companies comparable to that of assistant general superintendent in this country.

Mr. Kulvik and Mr. Jansson attended the meeting of the Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association in Seattle, December 5th and 6th.

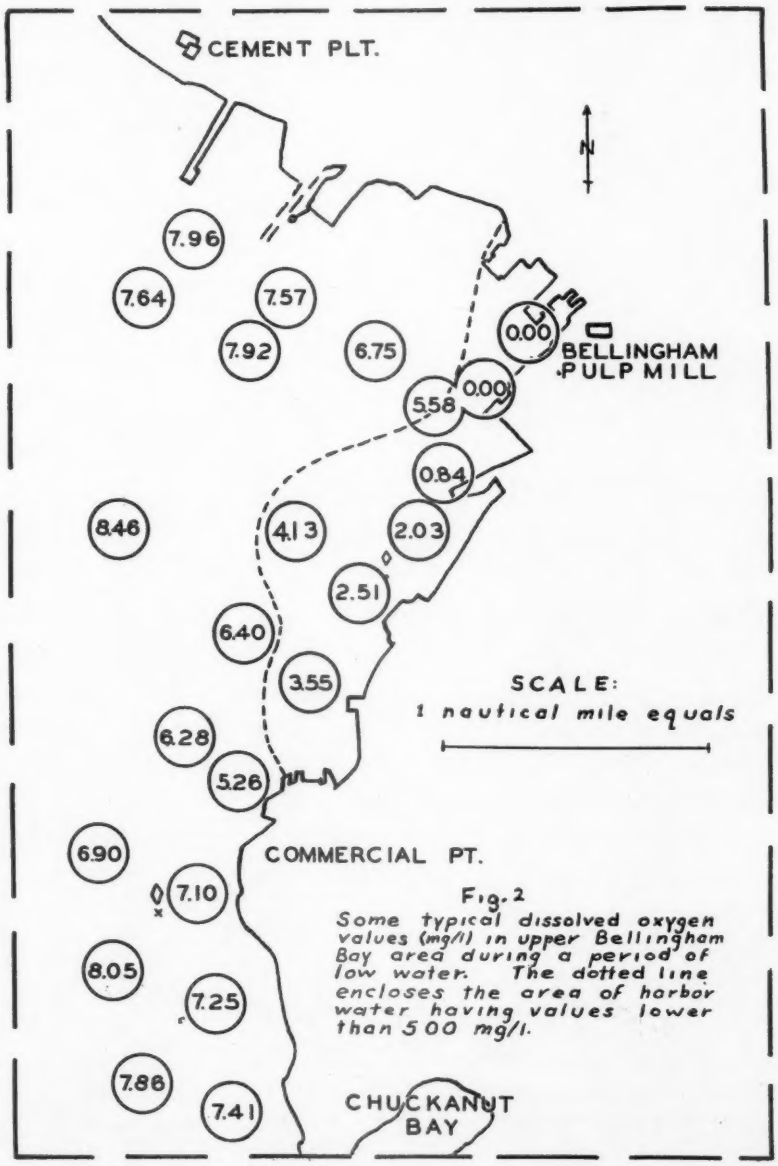
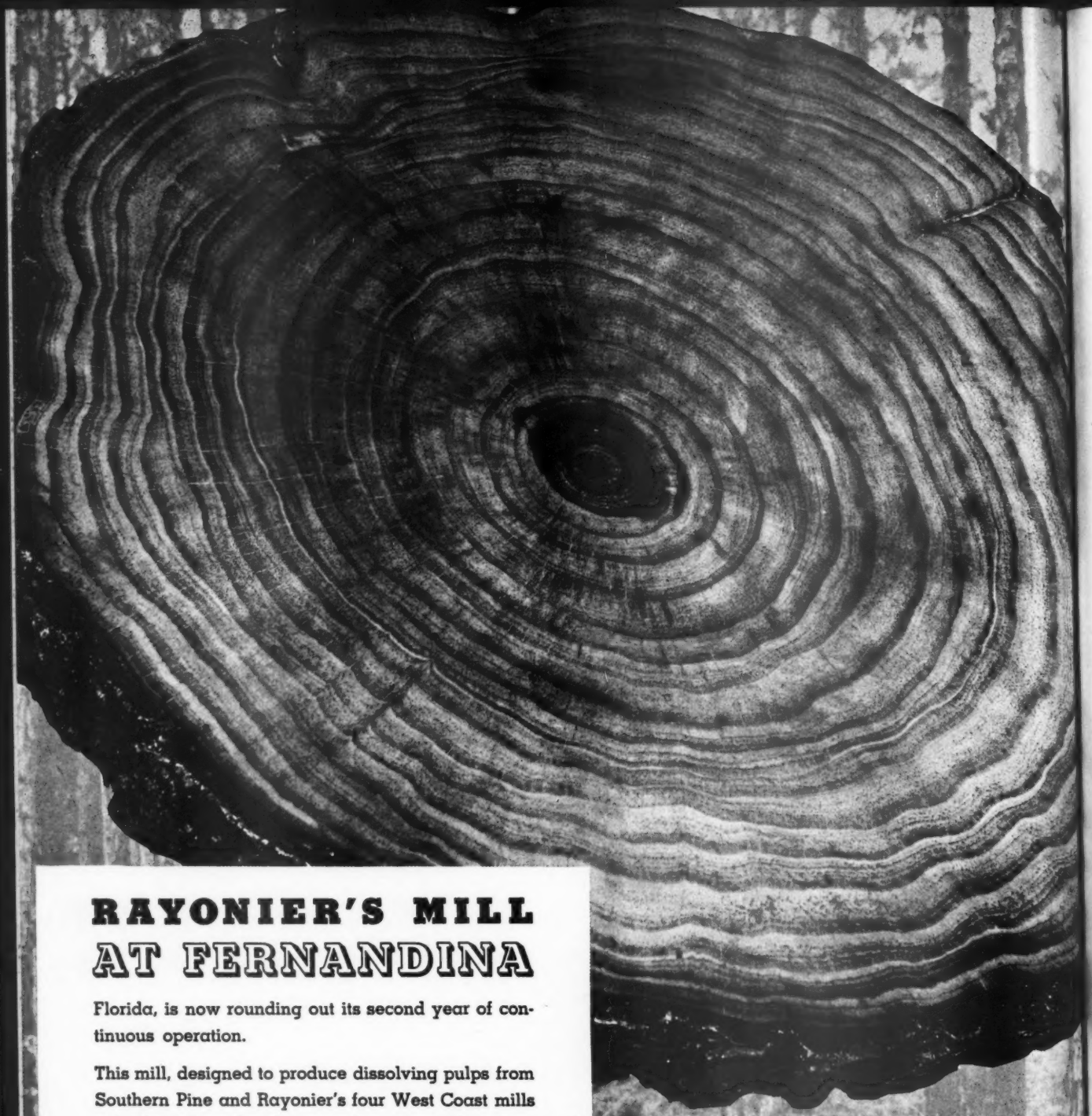


Fig. 2
Some typical dissolved oxygen values (mg/l) in upper Bellingham Bay area during a period of low water. The dotted line encloses the area of harbor water having values lower than 5.00 mg/l.



RAYONIER'S MILL AT FERNANDINA

Florida, is now rounding out its second year of continuous operation.

This mill, designed to produce dissolving pulps from Southern Pine and Rayonier's four West Coast mills manufacturing dissolving and paper pulps from Western Hemlock, are providing raw materials of vital importance for civilian and defense requirements.

Along with other leading domestic industrials, Rayonier is extending full cooperation to accelerate our National Defense Program.

★ ★ ★

Illustration above is a cross section of twenty year growth of Southern Pine. The actual diameter of this cross-section is 27 inches. On its fast growing timber stands in the South, Rayonier's selective cutting and conservation programs are designed to provide a continuous domestic supply of pulpwood.

RAYONIER
INCORPORATED

Better Pulps for Better Performance

Mills: Hoquiam, Port Angeles, Shelton, Tacoma, Wash. and Fernandina, Fla. • *Executive Offices:* 343 Sansome St., San Francisco • *Sales:* 122 East 42nd St., New York

Sweden Selling Large Tonnage of Dissolving Pulps

● The Swedish sulphite mills making dissolving wood pulps for rayon and staple fiber have sold more pulp than they were able to produce in 1941, according to The Swedish Wood Pulp Jorunal for October 15th. A recent order for 45,000 metric tons from Germany for delivery in 1941 could not be supplied in full and deliveries will have to be put off until early in 1942.

"For delivery during 1941 Sweden has sold 320,000 tons (metric) of viscose cellulose," says The Swedish Wood Pulp Journal, "whereof 170,000 tons to Italy, 125,000 tons to Germany and the remainder chiefly to Switzerland, Holland and Hungary.

"The part of the Swedish sulphite industry manufacturing viscose pulp will thus be very favourably employed in comparison with other branches of the pulp industry. The immediate cause of this is the tremendous development of the rayon and cell-wool (staple fiber) industries of Italy and Germany. But the textile industries of other European countries that are likewise cut off from cotton and wool supplies have also had to change over very extensively to synthetic fiber. Among them may be mentioned Holland, France, Switzerland and Hungary. Large sums of money are known to have been invested in Norway for the establishment of an artificial fiber industry based on home produced materials, and the same also applies to Sweden and Finland.

"Whether these industries, fostered on account of the war and blockade, can survive a 'peace crisis' future alone will show. It should be remembered, however, that in the U. S. A.—the home of cotton growing — the output and consumption of rayon and cell-wool products are steadily increasing at a rapid rate. The merits and qualities of rayon and cell-wool have now earned them a place as raw materials, and they can therefore no longer be regarded as substitutes, only to be used in times of crisis."

The pulp mills producing paper grades have not been so fortunate in obtaining orders, states The Swedish Wood Pulp Journal.

Billy Welsh Handling Port Angeles Christmas Campaign

● William D. (Billy) Welsh, from the Crown Zellerbach Corporation executive offices at San Francisco, has returned this month to his old familiar pre-Christmas role of "Beacon Bill the Blackmailer" at Port Angeles, Wash.

For more than 15 years, while editor of the Port Angeles Evening News, Mr. Welsh each December became "Beacon Bill" and ran a clever "blackmail" column, raising a large community fund to help the needy and underprivileged, especially the children, throughout the year. Since he became associated with Crown Zellerbach, his "boss," J. D. Zellerbach, has kindly loaned him each December to the Evening News and Port Angeles to carry on the campaign.

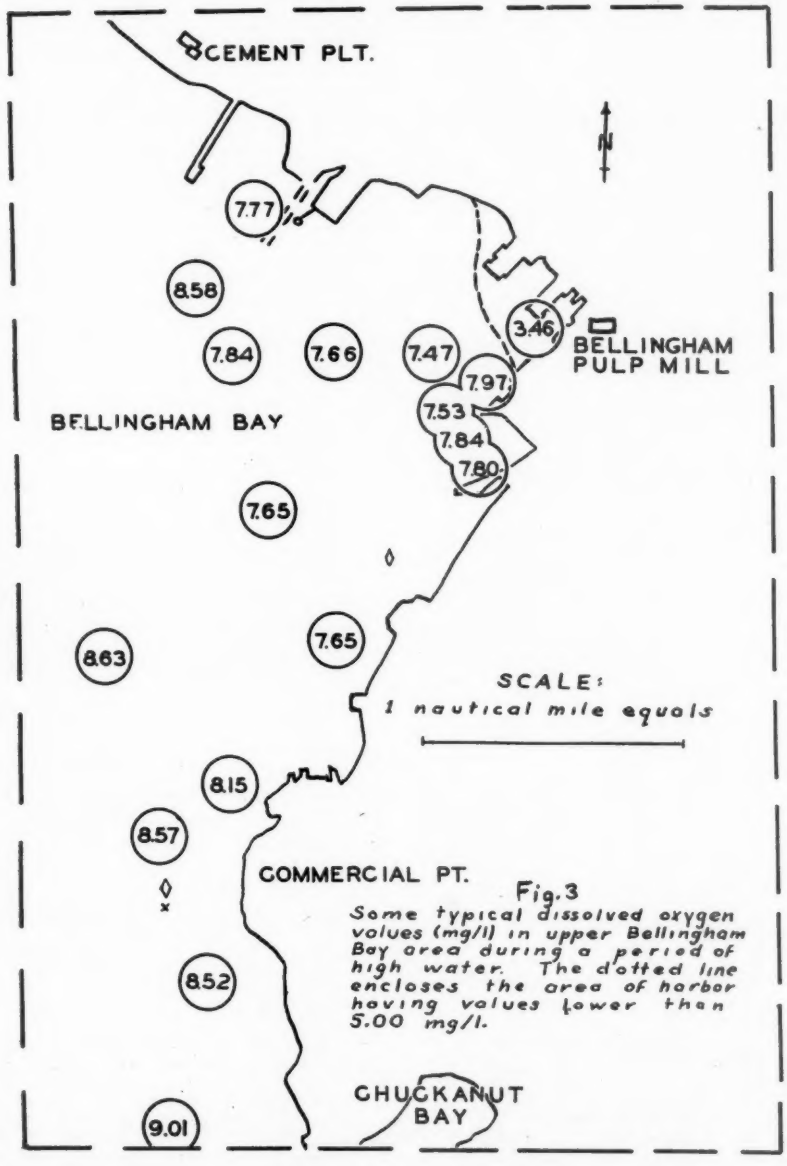


Fig. 3
Some typical dissolved oxygen values (mg/l) in upper Bellingham Bay area during a period of high water. The dotted line encloses the area of harbor having values lower than 5.00 mg/l.

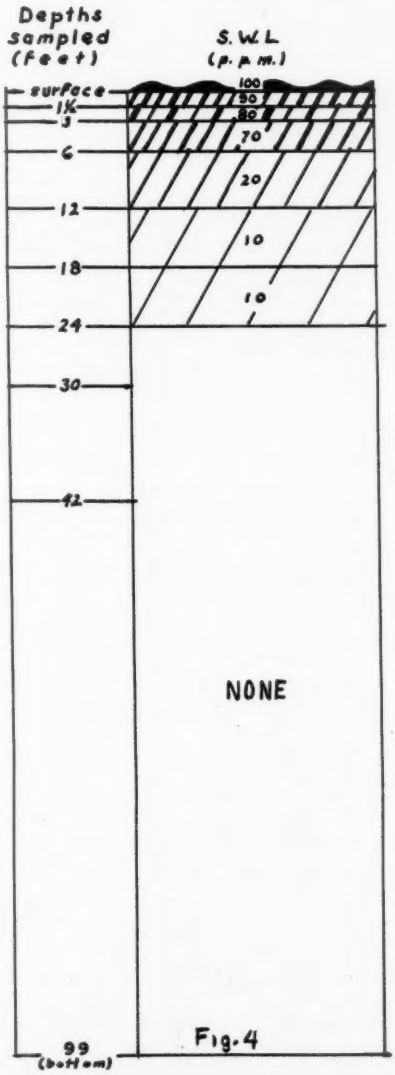


Fig. 4
Vertical Distribution of S.W.L.

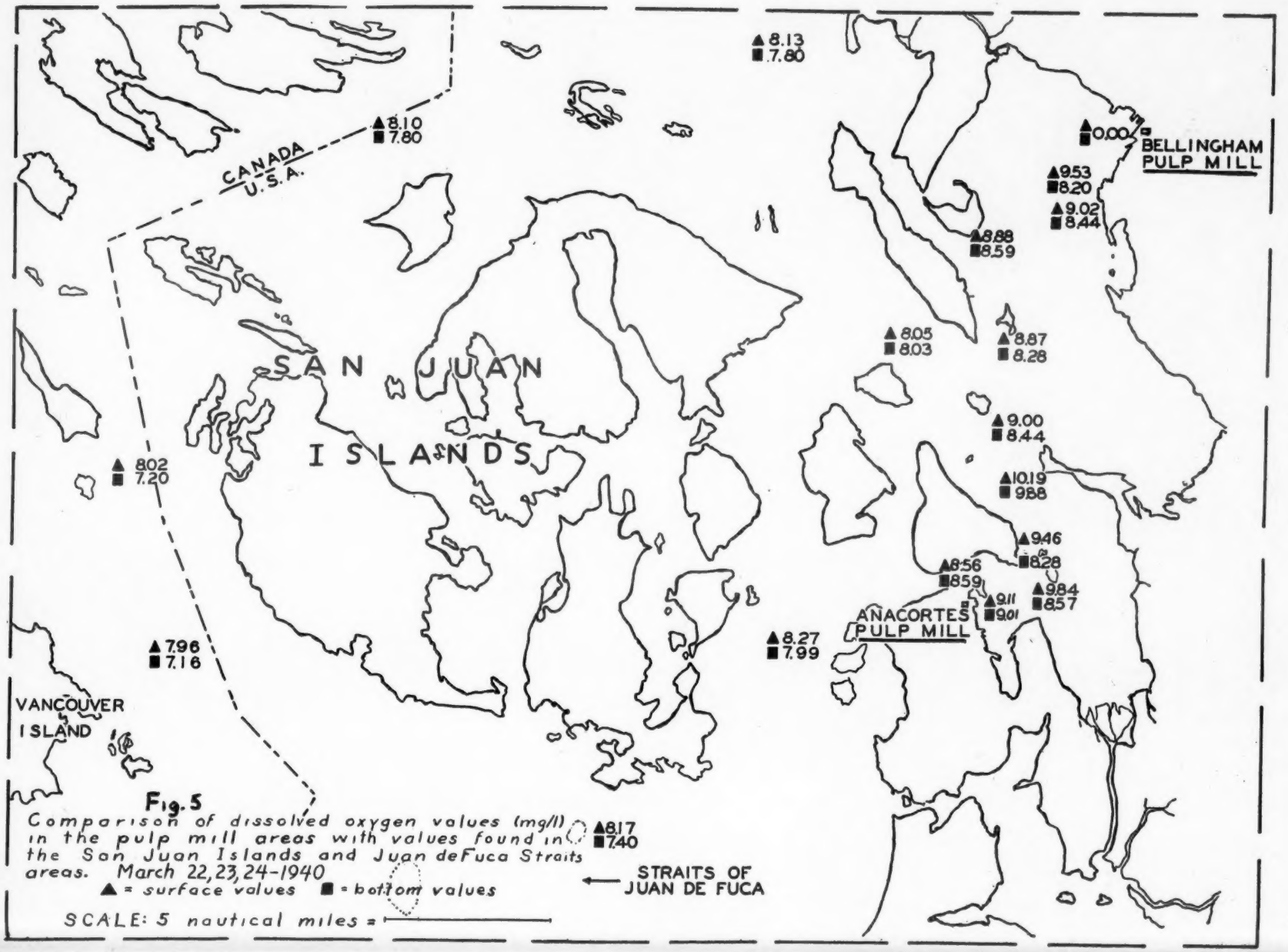


Fig. 5

Comparison of dissolved oxygen values (mg/l) in the pulp mill areas with values found in the San Juan Islands and Juan deFuca Straits areas. March 22, 23, 24-1940

▲ = surface values ■ = bottom values

Waldhof To Repair Kexholm Mill

● The Kexholm sulphite pulp mill, of about 100,000 metric tons annual capacity, located on Lake Ladoga in Finland, has been variously reported as completely destroyed, seriously damaged and only slightly damaged by the Russian-Finnish fighting of 1939 and 1941.

Owned by the largest German pulp producer, Zellstofffabrik Waldhof, the plant had been generally crossed off lists of European producers. However, The Swedish Wood Pulp Journal in its October 15th number reports as follows concerning the future of Kexholm.

"According to notices in the German trade papers, the Zellstofffabrik Waldhof has informed the Finnish government that it intends to repair the Kexholm sulphite mill, which has been damaged in the Russo-Finnish wars, and that work will be resumed there, though this will hardly be possible before 1943.

"The company has at its disposal for the rebuilding a loan previously granted for the building of quite a new plant instead of the Kexholm mill that was considered lost in the peace of Moscow. The interest on the loan is reported to be very low, and there will be no amortization for the first 15 years."

Canadian Pulp Production Rises In September

● Production of wood pulp in Canada scored a further gain in September, reaching a total of 498,001 short tons, air dry weight, of all grades except soda pulp, according to mills reporting to the Canadian Pulp and Paper Association, which include all but a small percentage of the productive capacity of the Dominion. The September output was the largest by a considerable margin in any previous month this year, comparing with 483,880 short tons in August, 467,607 tons in July, 432,671 tons in June, 448,524 tons in May, 424,559 tons in April, 418,807 tons in March, 365,823 tons in February, and 391,530 tons in January.

The production in September comprised 51,667 short air dry tons of bleached sulphite, against 52,016 tons in the preceding month, 100 per cent of the industry's capacity reporting; 14,181 tons of strong unbleached sulphite, against 14,519 tons, 100 per cent of the Canadian mills reporting; 86,760 tons of news grade unbleached sulphite, against 85,282 tons, 100 per cent of the industry reporting; 36,772 tons of sulphate pulp, against 35,906 tons, 95 per cent of the industry reporting, and 308,621 tons of ground wood, against 296,157 tons, 97 per cent of the mills in Canada reporting.

The report discloses that 362,423 tons of the September production was used by producing mills, contrasted with 350,650 tons in August, divided for September, 5,731 tons of bleached sulphite, 2,082 tons of strong sulphite, 55,047 tons of news grade sulphite, 18,753 tons of sulphate and 280,810 tons of ground wood. Shipments from producing mills, including those within Canada and for export to the United States and other countries, totaled 121,790 tons, against 153,012 tons in August. Exports in September were 108,963 tons, consisting of 40,334 tons of bleached sulphite, 12,985 tons of strong sulphite, 22,620 tons of news grade sulphite, 14,375 tons of sulphate and 18,649 tons of ground wood.

Stocks on hand at Canadian mills at the close of September totaled 53,977 short tons, compared with 40,413 tons a month previously, and consisted of 10,284 tons of bleached sulphite, 6,011 tons of strong sulphite, 13,309 tons of news grade sulphite, 1,833 tons of sulphate and 22,540 tons of ground wood.

First Aid Class Starts At Puget Sound

● A Red Cross first aid class was organized the middle of November at the mill of the Puget Sound Pulp & Timber Company at Bellingham with twenty-four men taking part. The Bellingham Red Cross Chapter plans a permanent detachment unit at the mill.

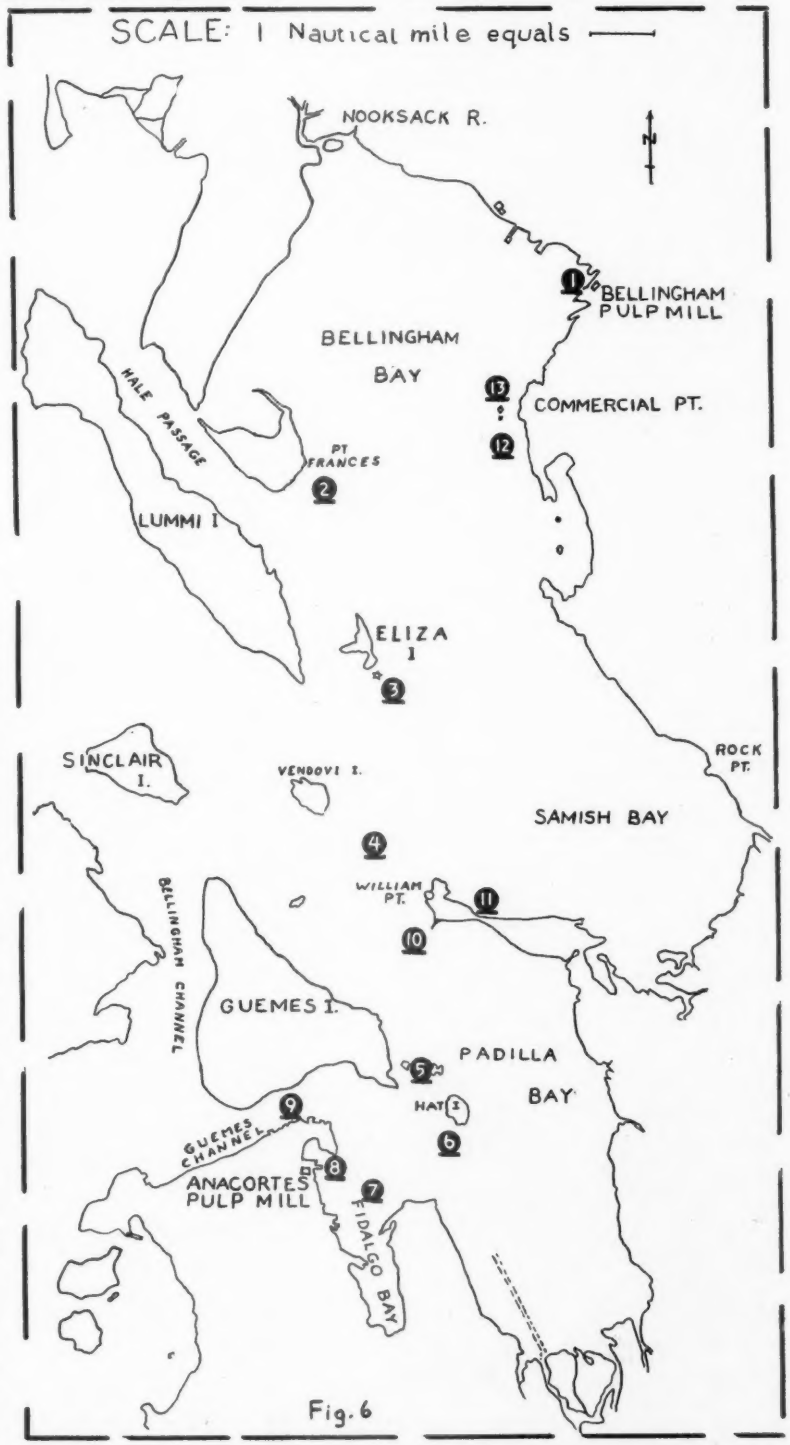


Fig. 6

Locations of the Thirteen Stations
Waste liquor found only at stations marked ●

TABLE II

	Station	Date (1940)	Sampling Time	High Tide Time	Low Tide Time	Depth (feet)	Temp. (° C.)	pH	Salinity (g/kilo)	D.O. (mg/l)	% Saturation D.O.	O_2 Consumed (mg/l)	S.W.L. (P.P.M.)
Surface	1	4-18	12:05	13:45	8:10	1½	12.10	7.34	19.45	———	———	40.32	1000
		4-30	11:25	12:05	7:10	1½	11.20	6.60	23.89	———	———	202.6	1000
		5-9	14:03	19:52	12:04	1½	12.11	5.70	25.35	———	———	204.0	8000
		6-5	12:40	18:23	10:30	1½	14.53	5.54	10.21	———	———	393.5	7000
Bottom	1	4-18	12:00	13:45	8:10	30	12.10	7.78	26.91	———	———	14.40	200
		4-30	11:19	12:05	7:10	38	10.10	7.39	29.07	———	———	22.00	0
		5-9	13:55	19:52	12:04	32	10.17	6.92	29.69	———	———	10.60	0
		6-5	12:34	18:23	10:30	25	12.00	6.53	28.12	———	———	24.60	30
Surface	2	2-27	9:32	7:44	14:10	1½	7.25	7.90	27.41	9.01	90.2	2.88	0
		3-8	11:26	16:57	10:58	1½	7.90	7.90	27.74	9.26	92.9	2.00	0
		4-18	9:54	13:45	8:10	1½	10.50	8.12	27.94	11.04	117.6	4.96	0
		5-27	9:56	7:58	14:50	1½	15.08	7.76	20.57	8.31	97.4	20.00	175
Bottom	2	2-27	9:23	7:44	14:10	12	7.70	7.90	28.89	8.65	87.3	2.64	0
		3-8	11:18	16:57	10:58	24	8.00	7.90	29.25	8.97	91.2	2.16	0
		4-18	9:43	13:45	8:10	18	10.50	7.89	28.69	10.57	113.0	4.80	0
		5-27	9:48	7:58	14:50	30	11.14	7.79	28.86	7.70	83.4	———	0
Surface	3	3-18	10:18	11:14	6:14	1½	8.33	7.95	27.68	9.16	93.0	2.64	10
		3-29	10:16	8:33	15:29	1½	9.00	8.00	29.25	9.46	98.3	4.06	10
		5-9	11:27	4:46	12:04	1½	12.49	7.99	29.23	10.15	113.4	3.28	30
		6-5	10:17	3:09	10:30	1½	13.90	7.86	27.11	9.13	106.1	2.56	0
Bottom	3	3-18	10:11	11:14	6:14	48	8.30	7.95	28.71	8.76	89.4	1.92	0
		3-29	10:06	8:33	15:29	66	8.65	7.95	29.52	8.29	85.7	1.92	0
		5-9	11:15	4:46	12:04	50	11.91	7.83	29.96	8.42	93.5	1.60	0
		6-5	10:08	3:09	10:30	54	10.72	7.68	29.27	7.27	79.9	1.52	0
Surface	4	3-5	10:46	14:45	9:17	1½	8.10	7.90	28.82	9.03	93.4	1.28	0
		3-22	10:24	15:51	9:49	1½	8.60	7.95	28.33	9.00	92.9	3.12	0
		5-16	11:11	12:14	6:39	1½	12.20	7.93	28.68	9.57	106.0	2.56	0
		6-3	10:25	16:44	9:11	1½	13.20	8.19	27.27	10.73	120.2	3.68	0
Bottom	4	3-5	10:39	14:45	9:17	96	8.14	7.90	29.49	8.22	84.0	1.12	0
		3-22	10:15	15:51	9:49	90	7.96	7.95	29.00	8.44	85.6	3.04	0
		5-16	11:02	12:14	6:39	120	9.90	7.89	29.69	7.82	81.2	2.64	0
		6-3	10:17	16:44	9:11	120	10.35	7.90	29.33	7.45	79.7	3.68	0
Surface	5	3-7	12:05	15:58	10:09	1½	7.96	7.95	27.47	9.28	93.2	1.60	0
		3-19	11:36	12:10	7:02	1½	9.20	7.95	27.27	9.34	96.2	2.48	0
		4-22	11:37	5:30	10:55	1½	11.20	8.11	27.59	10.60	114.2	1.60	0
		5-16	12:14	12:04	6:29	1½	11.40	7.86	28.84	8.57	95.2	2.00	0
Bottom	5	3-7	11:54	15:58	10:09	276	8.20	7.95	29.74	8.05	82.6	1.60	0
		3-19	11:28	12:10	7:02	264	8.32	7.95	29.09	8.16	83.5	1.84	0
		4-22	11:30	5:30	10:55	254	11.20	7.92	29.51	8.26	90.1	0.16	0
		5-16	12:05	12:04	6:29	264	9.82	7.82	29.52	8.30	88.0	2.08	0
Surface	6	3-12	12:48	19:18	12:45	1½	8.11	7.95	27.14	9.34	93.8	2.00	0
		3-26	12:44	19:21	12:28	1½	9.30	8.00	25.14	8.99	91.2	2.08	0
		5-16	12:42	12:04	17:33	1½	11.18	7.85	29.25	8.67	94.5	2.56	0
		5-29	11:50	10:35	16:04	1½	13.69	8.18	26.17	10.97	123.1	2.88	0
Bottom	6	3-12	12:42	6:30	12:45	96	8.19	7.95	27.65	8.47	85.7	2.00	0
		3-26	12:37	19:21	12:28	96	8.62	7.95	29.16	8.33	85.8	1.92	0
		5-16	12:31	12:04	17:33	96	10.20	7.80	29.74	7.99	85.5	2.00	0
		5-29	11:42	10:35	16:04	120	10.86	8.09	28.66	8.05	86.7	2.40	0
Surface	7	3-26	13:13	19:21	12:28	1½	9.16	8.00	29.05	8.74	91.1	1.84	0
		4-2	12:21	13:21	7:49	1½	———	8.00	29.00	8.81	———	2.16	10
		5-6	12:25	17:23	10:07	1½	11.08	8.09	29.38	9.32	101.5	2.80	0
		5-16	13:09	12:04	17:33	1½	11.30	7.90	28.46	9.06	98.4	2.40	0
Bottom	7	3-26	13:05	19:21	12:28	6	9.10	8.00	29.05	8.95	93.2	2.24	0
		4-2	12:15	13:21	7:49	18	———	7.95	29.23	8.53	———	1.52	0
		5-6	12:17	17:23	10:07	8	11.10	8.04	29.52	9.56	104.2	2.72	0
		5-16	12:59	12:04	17:33	7	11.20	7.91	29.43	9.55	104.2	2.88	0
Surface	8	3-5	13:22	14:25	8:57	1½	8.19	7.95	29.47	8.24	84.3	2.16	0
		3-19	12:41	12:10	18:55	1½	9.28	8.00	27.74	9.29	96.3	3.36	0
		4-8	12:38	17:54	11:04	1½	———	7.65	29.04	5.44	———	32.48	700
		5-23	13:46	19:29	11:55	1½	13.40	7.72	28.71	8.35	94.7	17.36	70
Bottom	8	3-5	13:14	14:25	8:57	15	8.10	7.97	29.31	8.24	84.1	2.08	0
		3-19	12:35	12:10	18:55	18	8.80	7.80	28.68	7.39	76.1	5.92	35
		4-8	12:26	17:54	11:04	12	———	8.00	29.29	8.57	———	3.20	10
		5-23	13:39	19:29	11:55	10	10.21	7.95	29.04	8.06	85.9	3.44	0
Surface	9	2-28	13:33	8:05	14:46	1½	7.96	7.90	29.33	8.22	83.6	0.64	0
		3-19	13:04	12:10	18:55	1½	9.10	8.00	28.17	9.16	94.8	2.32	0
		3-26	13:48	19:21	12:28	1½	8.90	7.95	28.80	8.57	88.6	1.84	0
		5-16	13:57	12:04	17:33	1½	11.40	7.85	29.36	8.46	92.6	2.80	0
Bottom	9	2-28	13:27	8:05	14:46	72	7.95	7.95	29.40	8.11	82.5	1.04	0
		3-19	12:58	12:10	18:55	72	8.39	7.95	29.09	8.40	86.1	1.84	0
		3-26	13:41	19:21	12:28	72	8.70	8.00	28.91	8.49	87.6	1.92	0
		5-16	13:50	12:04	17:33	60	10.38	7.80	29.56	8.11	87.0	2.48	0
Surface	10	3-7	11:25	15:56	10:09	1½	7.98	7.97	28.06	8.86	89.3	1.60	0
		3-19	11:04	12:10	7:02	1½	9.10	8.05	26.82	9.58	98.1	2.72	
		3-26	11:35	6:02	12:28	1½	10.90	8.20	26.78	9.03	96.0	2.64	0
		5-29	10:56	10:45	7:11	1½	12.88	8.20	25.46	11.32	124.4	4.00	0
Bottom	10	3-7	11:18	15:56	10:09	18	8.04	7.97	28.73	8.69	88.2	2.32	0
		3-19	10:56	12:10	7:02	21	8.60	8.00	28.22	9.16	93.7	2.32	0
		3-26	11:26	6:02	12:28	36	8.76	8.05	28.93	8.44	87.1	2.32	0
		5-29	10:49	10:45	7:11	6	12.70	8.15	25.66	10.97	120.4	3.68	0
Surface	11	2-28	9:54	8:25	15:06	1½	7.80	7.90	29.33	8.16	84.5	1.68	0
		3-7	10:18	4:55	10:29	1½	8.10	7.95	28.89	8.72	88.7	1.44	0
		5-29	9:59	10:45	7:11	1½	13.81	8.06	26.24	10.20	114.9	4.32	0
		6-3	9:54	16:44	9:11	1½	12.91	8.28	27.41	11.05	122.9	3.52	0
Bottom	11	2-28	9:45	8:25	15:06	18	7.90	7.90	29.36	8.16	82.9	2.16	0
		3-7	10:10	4:55	10:29	24	8.19	7.95	29.13	8.45	86.2	1.68	0
		5-29	9:52	10:45	7:11	11	12.48	7.79	27.14	8.93	98.4	3.76	0
		6-3	9:46	16:44	9:11	18	10.97	8.18	27.66	9.82	105.1	3.36	0
Surface	12	3-11	11:43	6:25	12:30	1½	7.70	7.85	24.72	8.82	86.4	6.08	25
		3-18	11:20	11:14	6:14	1½	8.72	7.90	26.08	9.26	93.6	4.64	25
		4-30	10:33	12:05	7:10	1½	10.33	8.00	27.95	10.61	112.5	5.84	0
		6-5	11:39	18:23	10:30	1½	15.40	7.80	25.81	8.56	99.1	4.40	0
Bottom	12	3-11	11:35	6:25	12:30	84	8.20	7.90	29.42	7.75	79.3	1.92	0
		3-18	11:14	11:14	6:14	90	8.27	7.90	29.23	7.77	79.5	1.76	0
		4-30	10:25	12:05	7:10	86	9.51	7.88	29.65	7.55	79.6	0.88	0
		6-5	11:30	18:23	10:30	78	10.10	7.61	29.52	6.18	65.9	2.08	0
Surface	13	3-4	9:50	13:43	8:27	1½	7.88	7.75	20.64	9.19	87.9	10.88	200
		3-18	11:42	11:14	6:14	1½	8.76	7.90	26.58	9.14	92.7	4.00	20
		4-30	10:52	12:05	7:10	1½	10.31	7.95	27.56	10.21	107.9	5.44	0
		5-9	13:19	19:52	12:04	1½	13.92	7.80	25.48	7.94	89.1	17.00	160
Bottom	13	3-4	9:39	13:43	8:27	72	———	7.90	29.11	8.70	———	1.76	0
		3-18	11:35	11:14	6:14	84	8.25	7.90	29.19	7.45	76.1	2.96	0
		4-30	10:45	12:05	7:10	80	9.50	7.86	29.65	7.59	80.0	2.16	0
		5-9	13:12	19:52	12:04	74	9.11	7.84	30.08	8.21	87.7	2.96	0

Paper and Paper Products Join Pulp Under Export Control

● Almost all paper and paper products exported from the United States were placed under export license control November 11th joining wood pulp which has been subjected to license for sometime.

Export Control Schedule No. 23 published by the Economic Defense Board, Office of Export Control, states that:

"Effective November 11, 1941, the forms, conversions, and derivatives of PAPER (Proclamation No. 2506) shall include the following, in addition to items previously determined:

"Printing paper: newsprint paper, book paper, not coated; cover paper; greaseproof and waterproof paper (include cellophane in sheets or rolls); wrapping paper, except kraft; krapt wrapping paper; surface coated paper in addition to that listed in previous numbered export control schedules; tissue and crepe paper; toilet paper; paper towels and napkins.

"Kraft container board; other boxboard (paper board and straw board); bristols and bristol board; other paper board; sheathing and building paper; fiber insulating board (1/8 inch and over in thickness); wallboard of paper or pulp (1/8 to 3/8 inch in thickness); blotting paper; filing folders, index cards, and other office forms, plain or printed; papeteries (fancy writing paper).

"Writing paper: bond, ledger and drawing; paper hangings (wall paper); paper bags: heavy shipping sack type and other; boxes and cartons; heavy fiber shipping containers of corrugated or solid container board; other boxes and cartons; envelopes; cash register and adding machine paper; other paper and paper products."

Countries of destination excepted from the export control license requirements are: Canada, Great Britain, Northern Ireland, Newfoundland, Iceland, and the Philippine Islands.

Mills Permitted to Buy Copper Products If Available

● The order of the Office of Production Management amended on November 1st its copper restriction order issued in October to permit copper and copper alloys to be used where chemical action makes any other material impractical.

The amended conservation order No. M-9-c contains a new paragraph, No. 8, under General Exceptions, which reads:

"The prohibitions and restrictions contained in paragraphs (a) and (c) shall not apply to the use of Copper or Copper Base Alloy in articles which are being produced (8) for use, repair or replacement purposes in plants employing chemical processes and in plants processing food where the existing installation is Copper or Copper Base Alloy and where and to the extent that chemical action makes the use of any other material impractical."

"This statement," reports the American Paper & Pulp Association, "will cover the paper industry. The effect of this paragraph is that, if copper is available, no restrictions will be placed on its use for fourdrinier wires, pipes, etc., so long as a chemical action makes the use of any other material impractical."

The Value of Waste Paper In Great Britain

● The importance of waste paper collections in Great Britain in the effort to maintain war effort was recently emphasized by an article in "The Times" of London. Quoted in "The World's Paper Trade Review" for October 31st, the article stated in part:

"A ton of paper will produce material for 9,000 shell fuse component parts or 47,000 boxes for small arms ammunition; 1,500 shell containers, 3,000 boxes for aero cannon shell, or 1,000 packing cases for two-pounder shell."

In nearly 25 months of war approximately 450,000 tons of waste paper were collected in England.

Drew & Hoffman Have New Office

● Drew & Hoffman, industrial heating, ventilating, drying and dust control engineers of Portland, Oregon, recently announced the removal of their offices from the Railway Exchange Building to 809 N. E. Lombard Street. Their telephone number is Murdock 8452.

In addition to their designing and construction supervisory work, E. G. "Sid" Drew and John Hoffman represent Foster Wheeler Corporation, J. O. Ross Engineering Corporation patented systems, Centrifix Corporation and V. D. Anderson steam traps.

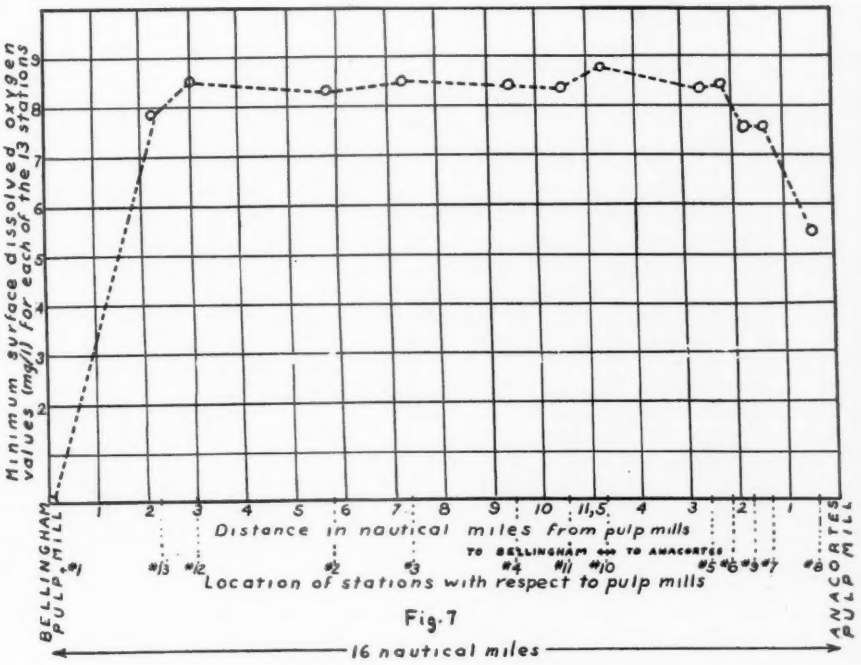


Fig. 7

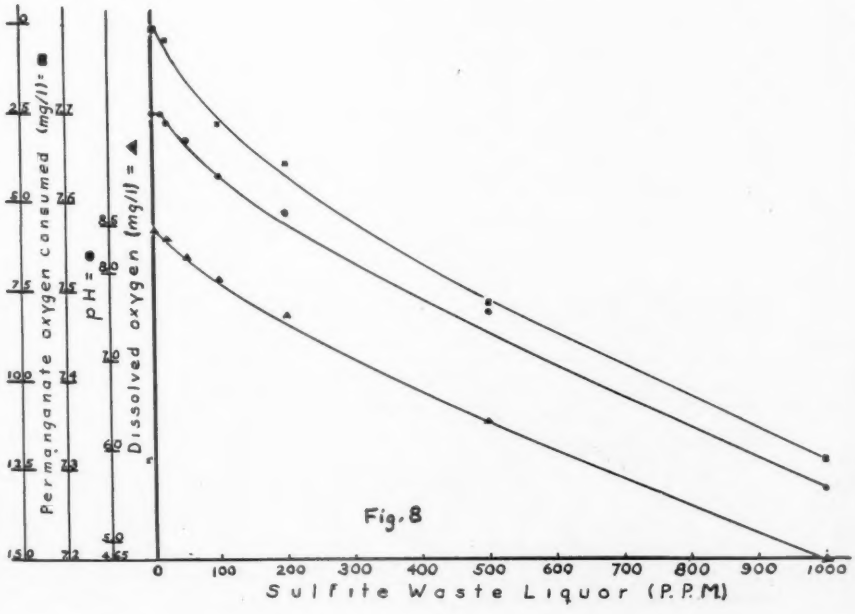


Fig. 8

Report On Use of Lignin To Remove Iron From Water

● In a paper released through TAPPI, G. H. Nelson and S. I. Aronovsky of the Agricultural By-Products Laboratory, Ames, Iowa, have reported that crude lignin may be used successfully in removing iron from water.

The abstract of their paper is as follows:

"The use of crude lignin powder for the removal of iron from water shows promising results. The percentage removal of iron varied from 85 to 97 per cent as the concentration of the lignin was varied from 16 to 500 parts per million. It is quite likely that by increasing the dosage of the crude lignin, as high an iron removal efficiency can be obtained as with purified lignin, and at lower cost. Color produced in the water by the lignin treatment may be eliminated by the use of alum followed by filtration.

"The use of lignin-impregnated filters for iron removal gave very encouraging results. A 5.5-inch depth of lignin impregnated corncob pulp removed from 65 to 90 per cent of the iron. As the filter depth was increased to 7.5 inches the iron removal efficiency was increased to about 96 per cent. This type of filter tends to clog fairly rapidly and needs frequent back-washing. The lignin-impregnated sand filter functioned more efficiently, removing from 95 to 99 per cent of the iron and yielding an effluent with low color (10 to 20 parts per million). No clogging difficulties were experienced with the sand filter.

"The use of crude lignin powder or sand filters impregnated with crude lignin were found to be very effective in removing the iron from high-iron waters."

The Agricultural By-Products Laboratory was transferred to the Northern Regional Research Laboratory, Peoria, Illinois, on July 1, 1941, and work is being continued there by the Agricultural Residues Division.

Navy Officers Wearing Paper Collars

● Due to the popularity of the soft collar, most men nowadays feel the stiff yoke only on formal occasion. But not so in the Navy where uniform regulations prescribe "a stiff turn-down collar, white."

Officers in the Thirteenth Naval District have recently been using a white collar. These are sold at ship's stores the appearance of standard grade linen collar. There are sold at ship's stores at five cents each, may be reversed for a second wearing, and are then thrown away.

The collars are manufactured by the Reversible Collar Company, Cambridge, Massachusetts.

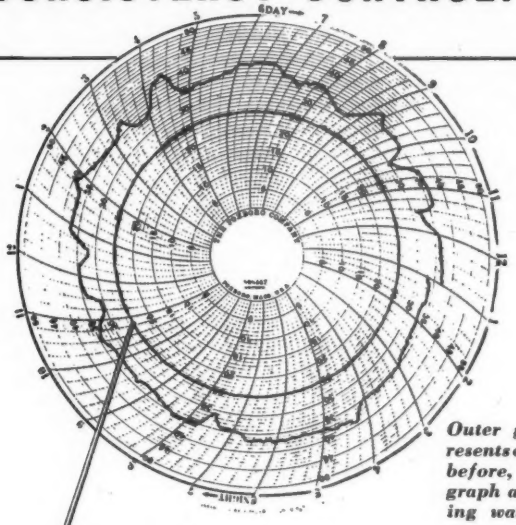
TABLE III

TIDAL CYCLE Commercial Pt. to Pt. Frances

	Station	Date (1941)	Sampling Time	High Tide Time	Low Tide Time	Depth (feet)	Temp. (° C.)	pH	Salinity (g/kilo)	D.O. (mg/l)	O_2 Consumed (mg/l)	S.W.L. (P.P.M.)
Surface	1	4-11	5:51	4:46	——	1½	10.50	7.70	26.18	8.38	7.36	100
			8:38	——	——	1½	10.81	7.66	25.83	8.16	11.12	140
			11:23	——	11:14	1½	10.39	7.79	23.81	9.27	9.12	110
			14:25	——	——	1½	11.80	7.71	22.80	9.12	10.15	90
			17:13	17:10	——	1½	10.64	7.90	28.27	10.74	8.56	30
Bottom	1	4-11	5:44	4:46	——	99	9.27	7.71	29.84	7.73	1.36	0
			8:32	——	——	102	9.27	7.78	29.77	7.81	0.72	0
			11:16	——	11:14	93	9.29	7.81	29.72	7.73	0.88	0
			14:19	——	——	105	9.30	7.79	29.84	7.65	1.52	0
			17:07	17:10	——	108	9.30	7.89	29.77	7.67	2.24	0
Surface	2	4-11	6:15	4:46	——	1½	10.58	7.75	26.63	8.81	5.92	60
			8:15	——	——	1½	10.50	7.81	26.81	8.55	6.80	100
			9:01	——	——	1½	10.59	7.73	26.19	8.41	8.72	100
			11:00	——	11:14	1½	11.45	7.81	25.33	8.61	9.12	110
			11:58	——	——	1½	11.52	7.80	24.68	8.65	8.96	100
			14:06	——	——	1½	10.88	7.80	25.05	8.94	8.96	80
			14:49	——	——	1½	10.92	7.78	25.68	8.49	9.76	90
			16:52	17:10	——	1½	11.28	7.87	25.58	8.40	8.88	30
Bottom	2	4-11	6:07	4:46	——	108	9.30	7.78	30.21	7.97	1.12	0
			8:10	——	——	102	9.31	7.80	29.80	7.87	0.64	0
			8:55	——	——	102	9.31	7.77	29.85	7.89	0.96	0
			10:54	——	11:14	102	9.34	7.85	30.00	7.83	0.88	0
			11:52	——	——	102	9.35	7.80	29.84	7.87	0.96	0
			13:56	——	——	108	9.32	7.82	29.82	7.87	1.28	0
			14:39	——	——	108	9.54	7.78	29.82	7.89	1.52	0
			16:46	17:10	——	105	9.40	7.89	29.92	7.77	1.12	0
Surface	3	4-11	6:39	4:46	——	1½	10.70	7.80	27.68	10.25	3.84	10
			7:56	——	——	1½	10.70	7.82	26.82	8.98	5.20	100
			9:25	——	——	1½	10.70	7.86	26.98	9.35	5.04	40
			10:39	——	11:14	1½	10.86	7.88	26.95	9.14	5.84	90
			12:18	——	——	1½	11.18	7.89	26.98	8.94	6.80	20
			13:37	——	——	1½	11.61	7.89	24.05	8.88	7.60	50
			15:12	——	——	1½	11.56	7.90	24.73	8.79	8.80	50
			16:32	17:10	——	1½	11.39	7.87	25.11	8.65	7.44	20
Bottom	3	4-11	6:33	4:46	——	102	9.38	7.78	29.77	8.02	0.64	0
			7:49	——	——	102	9.38	7.81	30.00	7.95	0.88	0
			9:20	——	——	93	9.87	7.78	29.79	7.93	0.72	0
			10:33	——	11:14	102	9.88	7.84	30.00	7.97	1.60	0
			12:12	——	——	102	9.38	7.82	29.81	7.83	0.96	0
			13:31	——	——	102	9.40	7.87	29.98	7.73	2.08	0
			15:03	——	——	114	9.40	7.85	29.81	7.79	1.28	0
			16:26	17:10	——	108	9.40	7.80	29.98	7.77	1.04	0
Surface	4	4-11	7:00	4:46	——	1½	10.12	7.78	28.84	8.94	2.72	0
			7:36	——	——	1½	9.87	7.82	29.08	8.77	2.24	0
			9:44	——	——	1½	10.80	7.88	27.43	9.49	4.64	15
			10:17	——	11:14	1½	10.99	7.92	27.28	9.47	5.28	10
			12:37	——	——	1½	11.16	7.92	27.03	9.47	5.36	10
			13:13	——	——	1½	11.19	7.93	27.21	9.43	5.44	10
			15:32	——	——	1½	13.47	7.91	23.23	9.45	5.36	20
			16:08	17:10	——	1½	12.20	7.93	25.51	8.73	6.80	30
Bottom	4	4-11	6:50	4:46	——	24	9.51	7.78	29.72	8.38	0.64	0
			7:31	——	——	24	9.58	7.81	29.64	8.40	0.80	0
			9:39	——	——	24	9.70	7.83	29.43	8.34	1.60	0
			10:12	——	11:14	24	9.70	7.86	29.40	8.51	1.68	0
			12:31	——	——	18	9.53	7.89	29.50	8.51	1.20	0
			13:07	——	——	24	9.58	7.93	29.64	8.28	1.44	0
			15:27	——	——	24	9.55	7.89	29.66	8.20	1.68	0
			16:02	17:10	——	27	9.54	7.85	29.60	7.79	1.44	0
Surface	5	4-11	7:21	4:46	——	1½	10.02	7.82	28.95	8.82	2.24	0
			10:02	——	11:14	1½	9.98	7.87	29.12	8.45	1.60	0
			12:54	——	——	1½	11.35	7.99	27.21	9.35	5.68	10
			15:47	17:10	——	1½	12.60	7.89	25.08	9.18	7.84	20
Bottom	5	4-11	7:15	4:46	——	78	9.40	7.79	29.85	8.06	1.12	0
			9:55	——	11:14	66	9.79	7.84	29.23	8.36	1.60	0
			12:47	——	——	78	9.30	7.89	29.81	8.14	1.52	0
			15:42	17:10	——	75	9.50	7.88	29.83	8.08	1.60	0

TO SECURE THE ANSWER TO YOUR CONSISTENCY REGULATION PROBLEMS, FILL OUT FORM BELOW AND RETURN TO US.

MAINTAIN YOUR STOCK CONSISTENCY REGULATION TO 1/10TH of 1% with the BRAMMER RECORDING CONSISTENCY CONTROL.



Outer graph represents consistency before, and inner graph after, diluting water added.

Regulator to be used on Machine No. .....

Regulator to be used for stock ahead of (name equipment) .....

Type of Paper Machine .....

Mill Product (Kind of Stock) .....

Bone Dry stock to be regulated per hour. Maximum .....Tons

Bone Dry stock to be regulated per hour. Minimum .....Tons

Is stock pump of such capacity and so operated that there is always an overflow back to chest .....

Does pump give unusual pulsations to stock .....

Is freeness of stock kept uniform .....

Approximate stock density at present. Maximum .....% Minimum.....%

What uniform consistency do you desire.....

Are consistency changes necessary at times.....

If variable consistency is necessary, what is consistency required..... Maximum.....% Minimum.....%

Minimum water pressure available.....

Do you always have this minimum pressure.....

Do you use fresh or white water for stock dilution .....

One Brammer requires 1.5 cu. ft. of free air per minute at 50 lbs. pressure. Is this quantity and pressure constantly available.....

Do you want a mechanical clock .....

Do you want an electric (Telechron) clock .....

Current characteristics are Volts..... Cycles .....

Do you use centrifugal or plunger stock pumps? .....

Gentlemen:
Above form filled in. Please furnish data, without obligation.

Company.....

Name.....Title.....

Address.....

City.....State.....PP

Why go along, month after month, with variations in stock consistency which cause complaints, trouble, waste of time and money? With the Brammer Control, you get *accurate* regulation of consistency and a continuous record of consistency both before and after diluting water has been added.

The Brammer *detects* instantly the slightest variation . . . records and corrects changes over a wide range, with precise accuracy. It is adaptable for all grades of stock, including rag.

Design is simple and unique. No lubrication required (except water valve stem) therefore minimizing wear and maintenance. Easy to install and operate. Instrument by Foxboro. In use by an ever increasing number of mills, with many repeat orders.

A few minutes of your time in filling in questionnaire, opposite, will prove advantageous to you.

Brammer Bulletin mailed upon request.

Licensed Under U. S. Patent Numbers: 1,810,111—1,884,075. Other Patents Pending.

Pacific Coast Representative: A. H. LUNDBERG 3311 First Avenue South, SEATTLE, WASHINGTON

PAPER and INDUSTRIAL APPLIANCES Incorporated
122 East 42nd Street, New York, N. Y.

Vocational Training Under Way By Port Angeles Mills

● Plans have been completed at Port Angeles, Wash., for the establishment of five up-grading trade extension classes in the mechanical trades employed in the three pulp and paper manufacturing plants, similar to programs under way at Camas and Grays Harbor.

Rayonier Incorporated, Crown Zellerbach Corporation and Fibreboard Products Incorporated, are cooperating in the program, which is under the supervision of the Port Angeles school district and state board for vocational education. The companies are supplying shop facilities and materials for the shop work portion of the courses.

An advisory committee consisting of representatives of mill management and labor and School Superintendent F. W. Breakey has chosen pipefitting, millwrighting, electrical, machinist and welding (arc and acetylene) work as subjects for the "school."

On the advisory committee for the program are six representatives of mill management, six of labor and the school superintendent. The management group includes Resident Managers A. W. Berggren of Rayonier Incorporated, R. A. Dupuis of Crown Zellerbach Corporation and R. E. Bundy of Fibreboard Products Incorporated, and Personnel and Safety Supervisors S. W. Grimes, M. R. Cashman and R. A. Lawrence of the same companies, in order. Labor representatives are Paul Neer, International Brotherhood of Paper Makers; Harry Larsen, Carmi Hanchett, Frank Waugh and Arthur Blair, International Brotherhood of Pulp, Sulphite and Papaper Mill Workers, and Joe Ross, Lumber and Sawmill Workers.

Resident engineers of the three companies are consultants. They are T. B. Hargreaves, Crown Zellerbach; Meder Johnson, Rayonier, and A. F. Benson, Fibreboard Products.

Otto R. Hartwig, general safety supervisor and social security director of the Rayonier and Crown Zellerbach companies and W. L. Sundstrom, assistant supervisor of the state board for vocational education, have given assistance and advice in setting up the program.

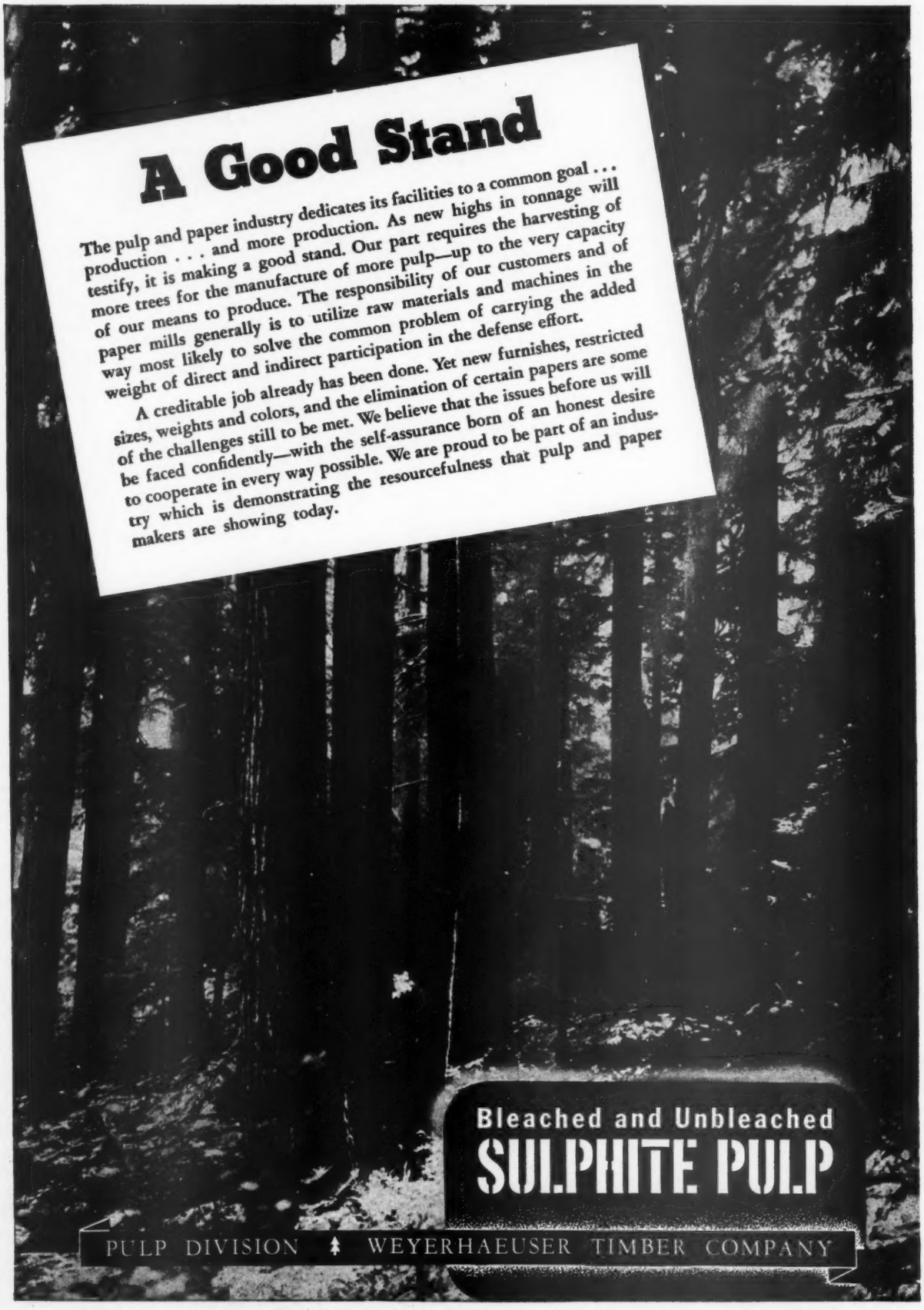
In addition to practical instruction in the mill shops, classes will be conducted at the high school in the following related subjects—shop mathematics, blueprint reading, mechanical drawing and freehand sketching. The school district will provide instructors for these. The shop instruction is to be given by teachers selected from foremen and lead men at the three mills.

Each class in shop work will meet twice weekly, two hours per session, over a term of 48 weeks. They are being arranged to meet shift work situations. Only cost to the enrollee will be the purchase of textbooks.

TABLE IV

TIDAL CYCLE William Pt. to Clark Pt.

	Station	Date (1941)	Sampling Time	High Tide Time	Low Tide Time	Depth (feet)	Temp. (° C.)	pH	Salinity (g/kilo)	D.O. (mg/l)	O_2 Consumed (mg/l)	S.W.L. (P.P.M.)
Surface	1	2-28	7:44	6:47	.....	1½	7.96	7.80	29.03	8.48	1.36	0
			10:32	.....	.....	1½	8.00	7.83	29.37	8.67	4.00	0
			13:12	.....	12:38	1½	8.12	7.82	29.10	8.61	1.36	0
			15:45	.....	.....	1½	8.57	7.80	27.78	9.07	1.36	0
			18:13	18:36	.....	1½	8.46	7.90	28.73	8.05	1.52	0
Bottom	1	2-28	7:37	6:47	.....	54	8.11	7.80	29.52	8.22	1.04	0
			10:24	.....	.....	48	8.20	7.82	29.48	8.16	1.28	0
			13:06	.....	12:38	30	8.10	7.81	29.52	8.30	1.28	0
			15:39	.....	.....	30	8.10	7.80	29.51	7.88	0.96	0
			18:07	18:36	.....	66	8.12	7.80	29.56	8.00	1.12	0
Surface	2	2-28	8:00	6:47	.....	1½	8.04	7.75	29.33	8.42	0.88	0
			10:09	.....	.....	1½	8.00	7.83	29.31	8.59	1.72	0
			10:48	.....	.....	1½	7.98	7.84	29.28	8.69	3.04	0
			12:53	.....	12:38	1½	8.40	7.81	29.04	8.89	1.28	0
			13:30	.....	.....	1½	8.21	7.82	29.11	8.93	0.96	0
			15:30	.....	.....	1½	8.21	7.82	29.30	8.38	1.92	0
			16:01	.....	.....	1½	8.20	7.80	29.20	8.59	1.20	0
			17:56	18:36	.....	1½	8.21	7.82	29.30	8.52	2.40	0
Bottom	2	2-28	7:54	6:47	.....	108	8.21	7.78	29.67	8.00	0.80	0
			10:00	.....	.....	96	8.22	7.82	29.71	8.12	0.88	0
			10:42	.....	.....	108	8.21	7.82	29.69	7.92	0.88	0
			12:47	.....	12:38	93	8.21	7.80	29.52	8.48	1.36	0
			13:24	.....	.....	105	8.22	7.79	29.65	7.86	1.12	0
			15:24	.....	.....	102	8.21	7.80	29.65	7.80	1.76	0
			15:55	.....	.....	111	8.22	7.78	29.69	7.39	1.52	0
			17:48	18:36	.....	120	8.21	7.81	29.67	7.82	2.32	0
Surface	3	2-28	8:20	6:47	.....	1½	7.80	7.81	29.48	8.63	1.68	0
			9:49	.....	.....	1½	8.03	7.83	29.46	8.54	1.04	0
			11:07	.....	.....	1½	8.03	7.83	29.48	8.44	3.20	0
			12:31	.....	12:38	1½	8.18	7.80	29.16	8.85	1.36	0
			13:52	.....	.....	1½	8.64	7.79	28.75	8.48	1.52	0
			15:09	.....	.....	1½	8.30	7.80	28.71	8.61	1.84	0
			16:22	.....	.....	1½	8.30	7.79	28.77	8.48	1.20	0
			17:36	18:36	.....	1½	8.21	7.82	28.83	8.54	1.52	0
Bottom	3	2-28	8:14	6:47	.....	63	8.22	7.81	29.65	8.06	1.05	0
			9:43	.....	.....	66	8.21	7.81	29.67	7.82	1.52	0
			11:01	.....	.....	66	8.23	7.83	29.69	7.35	2.24	0
			12:23	.....	12:38	66	8.24	7.80	29.61	8.06	1.04	0
			13:46	.....	.....	84	8.22	7.81	29.60	7.92	1.12	0
			15:03	.....	.....	75	8.21	7.79	29.63	7.60	1.52	0
			16:16	.....	.....	78	8.21	7.78	29.69	7.92	1.36	0
			17:30	18:36	.....	99	8.21	7.80	29.69	7.86	1.20	0
Surface	4	2-28	8:39	6:47	.....	1½	8.00	7.80	29.51	8.46	1.36	0
			9:24	.....	.....	1½	8.10	7.81	29.51	8.18	2.00	0
			11:29	.....	.....	1½	8.20	7.81	29.38	8.12	3.36	0
			12:06	.....	12:38	1½	8.10	7.81	29.44	8.48	0.88	0
			14:15	.....	.....	1½	8.40	7.79	28.75	8.52	1.52	0
			14:48	.....	.....	1½	8.32	7.78	28.83	8.48	1.68	0
			16:43	.....	.....	1½	8.40	7.78	29.18	8.48	1.20	0
			17:18	18:36	.....	1½	8.35	7.79	29.44	8.20	1.52	0
Bottom	4	2-28	8:33	6:47	.....	72	8.20	7.81	29.60	7.92	1.04	0
			9:18	.....	.....	78	8.21	7.80	29.65	7.92	2.40	0
			11:21	.....	.....	75	8.20	7.81	29.58	8.04	2.08	0
			12:01	.....	12:38	75	8.20	7.79	29.63	8.04	0.88	0
			14:09	.....	.....	75	8.22	7.79	29.60	7.96	1.12	0
			14:42	.....	.....	72	8.22	7.79	29.63	7.88	1.12	0
			16:38	.....	.....	72	8.24	7.73	29.67	8.00	1.28	0
			17:13	18:36	.....	84	8.22	7.50	29.65	7.94	1.52	0
Surface	5	2-28	8:50	6:47	.....	1½	8.01	7.82	29.46	8.48	1.52	0
			11:46	.....	12:38	1½	8.03	7.79	29.48	8.51	1.92	0
			14:31	.....	.....	1½	8.40	7.81	29.44	8.34	0.80	0
			17:01	18:36	.....	1½	8.38	7.77	29.50	8.32	0.96	0
Bottom	5	2-28	8:50	6:47	.....	108	8.20	7.81	29.62	8.20	1.44	0
			11:40	.....	12:38	63	8.20	7.78	29.65	8.08	2.08	0
			14:25	.....	.....	81	8.20	7.79	29.62	8.02	0.96	0
			16:55	18:36	.....	90	8.31	7.77	29.67	7.76	0.88	0


A Good Stand
The pulp and paper industry dedicates its facilities to a common goal . . . production . . . and more production. As new highs in tonnage will testify, it is making a good stand. Our part requires the harvesting of more trees for the manufacture of more pulp—up to the very capacity of our means to produce. The responsibility of our customers and of paper mills generally is to utilize raw materials and machines in the way most likely to solve the common problem of carrying the added weight of direct and indirect participation in the defense effort.
A creditable job already has been done. Yet new furnishes, restricted sizes, weights and colors, and the elimination of certain papers are some of the challenges still to be met. We believe that the issues before us will be faced confidently—with the self-assurance born of an honest desire to cooperate in every way possible. We are proud to be part of an industry which is demonstrating the resourcefulness that pulp and paper makers are showing today.
Bleached and Unbleached
SULPHITE PULP
PULP DIVISION WEYERHAEUSER TIMBER COMPANY

Treatment of Industrial Water Supplies

by J. M. MONTGOMERY*

WATER is probably the most important material used by the process industries. While the National Emergency Program is forcing manufacturers to seek substitutes for many materials which have been in common use, industry, fortunately, is not required to find something to take the place of water, the material for which there is no substitute.

In the making of paper, water is the material which is used in greatest quantity. Unlike most of the other raw materials, it is not a constituent of the final product but is used largely as a means of transportation for pulp, size, etc. Because it is used principally as a transportation medium, little consideration has been given to its quality, or fitness for the purpose used, until very recently.

A good many years ago, in a chemistry class, a professor asked me the question, "What is water?" Glibly, and with supreme assurance, I answered, "H_2O." In the course of the next few minutes, I learned that water is H_2O, to be sure, but that water as we know it is always a solution, more or less dilute, which may contain a wide variety of material depending upon its source. The term "pure water" is often used but this refers to its suitability for drinking purposes. All natural waters are impure and the impurities may have a profound effect on the quality of manufactured products and on the cost of production.

Most commonly found in solution in water are calcium, magnesium, sodium, potassium, iron, manganese, bicarbonate, carbonate, sulfate, chloride, nitrate, silica, alumina, carbon dioxide, hydrogen sulfide, oxygen, nitrogen, and organic matter. Both the amounts and, to a certain extent, the types of impurities vary widely in different sections of the country. In this connection it is interesting to note that many of the large paper making centers of the country are located where abundant water of unusually low mineral content is available. The available supplies in the Los Angeles district are, for the most part, quite highly mineralized.

It is true that so-called highly mineralized waters are really very dilute solutions, the amounts of mineral being measured in such units as parts per million or grains per gallon. When, however, large quantities of water are used the actual weight of dissolved substances may have to be measured in tons. At the softening plant of The Metropolitan Water District of Southern California, which is now processing approximately fifty million gallons of water per day, more than ten tons of calcium carbonate are being removed from the water by lime treatment and nearly 20 tons of sodium ions by zeolite treatment are exchanged for approximately 4 1/3 tons of magnesium ions and 10 tons of calicum ions each day.

Water Contains Unwanted Raw Materials

● In the manufacture of paper, the impurities in the water should be taken into consideration because the amounts present may equal or exceed the quantities of some of the raw materials which are used. Chemical reactions take place which may be wasteful of materials and which may adversely affect the quality of the product. The impurities in the water are actually unwanted raw materials in the paper-making process and they probably account for many failures to produce paper of equal quality in two mills located in different parts of the country even though the same process, the same equipment, and the same raw materials are being used.

It has been estimated that in the pulp and paper industry approximately 150,000 gallons of water are required per ton

TABLE V

TIDAL CYCLE Guemes I. to Hat I. to March Pt.

	Station	Date (1941)	Sampling Time	High Tide Time	Low Tide Time	Depth (feet)	Temp. (° C.)	pH	Salinity (g/kilo)	D.O. (mg/l)	O_2 Consumed (mg/l)	S.W.L. (P.P.M.)
Surface	1	2-14	8:36	7:06	———	1½	———	7.88	29.32	8.11	1.32	0
			10:49	———	———	1½	7.98	7.97	29.30	8.15	1.56	0
			12:49	———	13:14	1½	8.05	8.00	29.33	8.00	1.60	0
			14:52	———	———	1½	8.01	7.98	29.11	8.19	1.44	0
			16:45	19:20	———	1½	8.13	7.82	29.33	7.92	1.52	0
Bottom	1	2-14	8:26	7:06	———	210	8.20	7.76	29.50	7.84	1.12	0
			10:38	———	———	204	8.11	7.92	29.48	8.11	1.04	0
			12:41	———	13:14	192	8.08	7.98	29.33	8.11	1.48	0
			14:44	———	———	228	8.17	7.96	29.40	7.78	1.44	0
			16:38	19:20	———	198	8.14	7.97	29.44	7.74	1.28	0
Surface	2	2-14	8:51	7:06	———	1½	8.16	7.94	29.43	8.09	0.92	0
			10:25	———	———	1½	7.82	7.90	29.11	8.13	1.52	0
			11:08	———	———	1½	7.91	7.99	29.11	8.00	0.96	0
			12:31	———	———	1½	8.05	7.99	29.20	7.92	1.56	0
			13:10	———	13:14	1½	7.56	8.01	28.83	8.47	1.40	0
			14:33	———	———	1½	7.97	7.97	28.65	8.08	1.44	0
			15:09	———	———	1½	7.93	8.00	28.12	8.68	1.44	0
			16:30	19:20	———	1½	7.94	7.98	28.53	8.35	1.56	0
Bottom	2	2-14	8:48	7:06	———	156	8.20	7.93	29.48	7.64	1.04	0
			10:18	———	———	150	8.19	7.93	29.52	7.84	1.48	0
			11:01	———	———	120	8.18	7.95	29.50	7.66	0.80	0
			12:24	———	———	126	8.13	7.94	29.50	7.82	1.32	0
			13:03	———	13:14	150	8.12	7.96	29.50	7.72	1.40	0
			14:27	———	———	150	8.10	7.99	29.50	7.82	1.40	0
			15:02	———	———	120	8.10	7.96	29.50	7.84	1.28	0
			16:21	19:20	———	126	8.18	7.97	29.48	7.88	1.36	0
Surface	3	2-14	9:18	7:06	———	1½	8.15	7.95	29.48	7.68	0.96	0
			10:04	———	———	1½	8.08	7.93	29.18	7.86	1.36	0
			11:26	———	———	1½	7.97	7.98	29.09	7.80	1.24	0
			12:12	———	———	1½	7.66	8.00	28.03	8.45	1.52	0
			13:30	———	13:14	1½	7.63	7.76	26.91	8.90	1.28	0
			14:13	———	———	1½	7.80	8.01	27.07	8.74	1.52	0
			15:31	———	———	1½	8.21	8.00	28.14	8.27	1.32	0
			16:07	19:20	———	1½	8.09	7.98	28.10	8.43	1.28	0
Bottom	3	2-14	9:10	7:06	———	90	8.20	7.93	29.60	7.68	1.28	0
			9:56	———	———	126	8.18	7.92	29.50	7.72	1.48	0
			11:19	———	———	138	8.17	7.95	29.52	7.72	1.12	0
			12:05	———	———	132	8.19	7.99	29.46	7.76	0.88	0
			13:23	———	13:14	138	8.20	7.99	29.52	7.82	1.36	0
			14:04	———	———	98	8.20	7.95	29.50	7.78	1.36	0
			15:20	———	———	138	8.14	7.96	29.48	7.80	1.16	0
			16:01	19:20	———	90	8.11	7.97	29.46	7.70	1.16	0
Surface	4	2-14	9:41	7:06	———	1½	7.98	7.94	29.16	7.72	1.04	0
			11:46	———	———	1½	7.30	7.99	25.12	8.72	1.44	0
			13:51	———	13:14	1½	7.79	7.99	26.21	9.11	1.28	0
			15:48	19:20	———	1½	8.19	8.02	27.71	9.04	1.32	0
Bottom	4	2-14	9:32	7:06	———	9	8.05	7.94	29.16	8.02	1.36	0
			11:40	———	———	8	7.60	8.00	27.88	8.74	1.52	0
			13:43	———	13:14	8	7.62	8.01	24.41	9.09	1.12	0
			15:42	19:20	———	8	8.23	8.02	28.48	9.04	1.28	0

of pulp. This quantity of water from a typical well in Vernon, according to a late analysis, would contain:

	Lbs.
Silica	24.8
Alumina	4.5
Iron oxide	0.2
Calcium bicarbonate	330.0
Magnesium bicarbonate	49.5
Magnesium sulfate	74.6
Sodium sulfate	80.8
Sodium chloride	62.2
Total dissolved salts	626.6

When water from this well is used for paper making, provided that the per ton figure of 150,000 gallons is correct, each ton of paper would be made from the usual materials plus 626.6 lbs. of assorted salts, some of which would have an adverse effect on the quality of the product. The calcium and magnesium salts make the water hard and are most likely to cause trouble.

Cause Size Trouble

● The hardness-forming calcium and magnesium salts react with the size. The formation of a curdy precipitate when soap is added to a hard water is well known to everyone. The familiar "ring around the bathtub" shows the sticky character of the combinations of soap with calcium and magnesium. Since the rosin size is a soap, it reacts with the hardness of the water to give a typical curdy precipitate. These curds are undoubtedly present in the finished paper and quite likely affect its quality. Due to this recation, the sizing material, when such a water supply is used, will probably be a mixture of aluminum, calcium and magnesium resinates instead of aluminum resinate alone and the character of the size will vary as the ratio of aluminum to calcium to magnesium varies.

The calcium and magnesium bicarbonates react with alum to preciptate insoluble hydrated aluminum oxide. The amount of alum used in the paper-making process is controlled according to the pH, and in consequence is roughly proportional to the alkalinity due to the size and to the bicarbonates in the water. This accounts for the much larger quantity of alum required for paper making in this district than is required in the Pacific Northwest where the water is soft. Where a large amount of alum is used, a correspondingly large amount of hydrated aluminum oxide will precipitate. This doubtless affects the quality of the paper and tends to clog the felt.

Sheet Formation May Be Affected

● When alum recats with calcium and magnesium bicarbonates, in addition to the precipitation of hydrated aluminum oxide, carbon dioxide is released. When the carbon dioxide content in water exceeds about 25 p.p.m., the sheet formation on the paper-making machine may be seriously affected. With alum added to the water, described above, the carbon dioxide would probably greatly exceed 25 p.p.m. Probably a limit of 10 p.p.m. of carbon dioxide is desirable.

Calcium bicarbonate may also cause trouble by forming a scale on various pieces of equipment. This happens most frequently with well waters which, due to the release of carbon dioxide when pumped from the ground, become supersaturated with calcium carbonate and cause scale to form.

Harmful constitutents other than those contained in the Vernon well may be present in water supplies. Suspended matter in excess of about 10 p.p.m. will clog wires and felts, and may affect the brightness and color of the product. Iron and manganese are particularly harmful because they discolor the pulp and paper.

No Single Simple Remedy

● There is no single simple remedy for the troubles caused by impure water. The chemical characteristics of water supplies and the physical features of the mills vary to such an extent that, where treatment is carried out on a large scale, both the process and the plant should be "tailor-made." If iron, manganese, suspended matter or color in the water supply are giving difficulty, usually filtration or coagulation, followed by filtration will suffice. If hardness is responsible, some means of softening will be the remedy. Fortunately, softening will usually remove other causes of trouble along with the hardness. Adjustment of the pH can be accomplished during the treatment process.

In the time allotted, it will be impossible to fully cover the subject of water softening. Briefly, however, the lime-soda-ash process and the zeolite base exchange process or combinations of the two are the methods which are usually

*Montgomery & Pomeroy, water treatment engineers, Los Angeles. Presented at the August 7, 1941, dinner meeting of the Papermakers and Associates of Southern California, Los Angeles, California.

most economical. In the lime-soda-ash process lime is used to remove carbonate hardness and magnesium, and soda ash is used to remove non-carbonate hardness. The zeolite process, using common salt for regeneration, softens water by substituting non-hardness-forming sodium for the calcium and magnesium contained in the water.

A recently developed base exchange process using a carbonaceous zeolite with sulfuric acid for regeneration works well with high bicarbonate waters, by completely removing carbonate hardness, and is in use in some mills.

The lime-soda-ash process accomplishes a reduction in the total solids content because the carbonate hardness actually is removed from the water. There is no reduction in total solids when zeolite regenerated with salt is used.

The choice of process depends, of course, upon what the water contains but in general it may be said that where it can be used, lime treatment accomplishes softening most economically; zeolite softening with salt regeneration is next, and soda ash is next.

Softening with carbonaceous zeolite, using acid for regeneration, depends to such an extent upon the character of the water that it is difficult to make a general statement of its cost as compared with other processes.

The benefits to be derived from water treatment usually appear as improved quality of the product and reduced cost of production. By using water of good quality, the process can better be standardized and simplified with more assurance of quality in the final product. In the Vernon district, softening (probably by the lime-soda ash process) would certainly reduce the cost of manufacture by eliminating scale formation, reducing frothing, increasing life of felts, reducing time lost in cleaning felts, and probably by saving enough alum to pay for the entire cost of softening, including chemicals, labor and fixed charges.

News Production Down Slightly In Ten Months

● Production in Canada during October, 1941, amounted to 318,787 tons and shipments to 304,685 tons. Production in the United States was 87,068 tons and shipments 87,318 tons, making a total United States and Canadian newsprint production of 405,855 tons and shipments of 392,003 tons. During October, 30,132 tons of newsprint were made in Newfoundland, so that the total North American production for the month arounted to 435,987 tons. Total production in October, 1940, was 429,722 tons.

The Canadian mills produced 58,828 tons less in the first ten months of 1941 than in the first ten months of 1940, which was a decrease of two per cent. The output in the United States was 3,349 tons or four-tenths of one per cent more than in the first ten months of 1940; in Newfoundland production was 585 tons or two-tenths of one per cent more, making a net decrease of 54,894 tons, or one and four-tenths per cent less than in the first ten months of 1940.

Stocks of newsprint paper at the end of October were 162,582 tons at Canadian mills and 11,614 tons at United States mills, making a combined total of 174,196 tons compared with 160,344 tons on September 30, 1941, and 198,974 tons at the end of October, 1940.

Penn Salt Issues New Chlorine Bulletin

● The sixth edition of the Pennsylvania Salt Manufacturing Company's popular 48-page booklet, "Chlorine," has just recently been issued. To bring the booklet up to date the sixth edition has been generally rewritten.

"Chlorine" is a technical treatise on the properties, packages, safe handling and uses of chlorine. "This useful commodity has grown both in tonnage and importance since the first edition of our chlorine bulletin in 1923," says the foreword, "in which we made this prediction: 'It should be borne in mind that we are rapidly approaching the time when liquid chlorine will be generally recognized as one of the most common and useful oxidizing agents, because the processes of bleaching, sterilization, deodorization and ore extraction are to a large extent oxidizing actions.'

"The quantity of chlorine used in the United States has grown from about 150,000 tons in 1923 to 697,000 tons in 1940. Many improvements in older uses, as well as a large number of new uses, have caused this increase in consumption.

"We have pioneered in the production of liquid chlorine in North America, the first tank car of this commodity ever shipped in North America being moved from our Wyandotte works in 1909. Our operations have been continuous since that time, and have been expanded until today our Wyandotte works is one of the largest chlorine producing plants in the United States. We also operate another large and important chlorine producing plant at Tacoma, Washington, serving the western sections of the United States and Canada.

"Of the many known chemical and physical properties of this useful element, we have included herein only the most frequently needed data, expressed in commonly used units of measurement. A section of equivalents is added to simplify conversion of these figures into other methods of measurement and expression.

"The construction details of chlorine shipping packages have been given detailed attention, particularly with respect to the safety aspects of each type of container.

"In the recommendations for safe handling of chlorine, and what to do in case of emergencies, we have drawn liberally from the advices of the Chlorine Institute Committee on Container Specifications and Safety, which group consists of technical representatives from each of the principal chlorine producers in the United States and Canada.

"The manufacture of simple chlorine compounds has been covered sufficiently to provide an understanding of their possibilities. It is not feasible in a bulletin of this type to give comprehensive treatment to the many other uses of chlorine, but we are prepared to render such service on request. If additional technical information is desired, we will be pleased to make a study of the problem and give special advices.

"Operators of chlorine gas dispensing equipment will be particularly interested in the two articles on chlorine purification appearing in the Appendix to this bulletin."

Copies of the new bulletin, "Chlorine," may be obtained from The Pennsylvania Salt Manufacturing Company, Widener Building, Philadelphia, Pa., or from The Pennsylvania Salt Manufacturing Company of Washington, Tacoma, Washington.

Hawley Resumes Mill A Grinding

● Mill "A" of Hawley Pulp and Paper Company, Oregon City, Oregon, resumed operation of twenty grinders on November 14th, after being shut down during the low-water season of the past few months. In mid November the Willamette river rose sufficiently to again supply water-power to the stones in Mill "A."

Black-Clawson-Shartle-Dilts New Engineering Service

A new, non-cost dimension sheet service to speed up the making of mill layouts has been announced by Black-Clawson and its two divisions, Shartle Bros. and Dilts.

These new sheets are accurately drawn to three different scales, ¼-in., $\frac{3}{16}$-in. and ⅛-in., and printed on transparent paper. Since mill layouts are customarily made to one of these three scales, these sheets can be used by all mill draftsmen.

Each sheet is a complete dimension print of some unit of paper mill machinery, such as a jordan, a valve, or a drive. By placing the needed sheet under the new layout, the machine needed can be traced quickly and accurately. Gone are inaccuracies, guesswork, and most important, the need to make changes when the true dimensions are later obtained.

Further uses for these dimension sheets have been suggested. These include checking of old layouts, photographing for extra prints, and comparisons with other machinery.

The entire service is offered to paper mills without charge. A permanent, loose-leaf binder is furnished with the sheets already prepared. Additional sheets are furnished each month, distribution being made in the Black-Clawson-Shartle-Dilts house-organ, the Messenger, or direct by mail, on request.

Requests for copies by production and drafting executives are given prompt attention.

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